THE

AMERICAN GAS-LIGHT JOURNAL

AND

MINING REPORTER.

Rooms 27 and 28—No. 15 Nassau Street, corner of Pine Street, New York.

VOL. VI.—No. 7—WHOLE No. 115. NEW YORK, MONDAY, OCT. 3, 1864. $3 PER ANNUM—IN ADVANCE.

PETROLEUM.

THE SUPPOSED ANIMAL ORIGIN OF PETROLEUM.

There would seem to be no doubt, that evidences in sufficient number to furnish a rule for the guidance of prospectors in searching for oil are obtainable; but thus far the opinions of those having most prominent views have not been of a character to either guide or stimulate investigation. Sterry Hunt, speaking of the Canadian geologists, after giving portions of the history of Petroleum, says, in effect, "Gentlemen, we do not know anything about it." While Prof. Lesley advances but little of his own, and even that little is entirely untenable. He asks: "Whence, then, comes the oil, and why is it collected in reservoirs? How are such reservoirs preserved, and what is their extent? It is easy, after these questions have been answered, to describe the mechanical propulsion of the oil to the surface, partly by gravity and partly by pressure of the gas it has itself generated, through natural fissures, producing oil springs, or through artificial augur holes." But where shall we find the solution of the questions propounded by the Professor? Certainly not in the treatise in which they are contained; and we are left as much in the dark as to the origin of the oil formations by the Professor, as we are by the writings of Sterry Hunt. Prof. Lesley holds the opinion entertained by many others, that the formation of the oil is partially due to animal remains. The black slates, and even the coal beds are, in fact, layers of marl, charged slightly or to excess, with lignite matter, peat or humus, part of which has assumed the form of glance coal, and part the form of mineral charcoal, but almost none of which is soluble in benzole or sulphuret of carbon; whereas these liquids easily dissolve out the ready-formed bitumen from the rocks which may contain them. But whenever a coal bed becomes a depositary of dead fish, like the eight-foot coal bed at the mouth of Yellow creek, at the bend of the Ohio, or as in the case of the two-foot stratum of phosphatic iron-ore, deposited between the two benches of the Deep River coal bed, at Egypt, in North Carolina, how different the aspect the mineral then wears—glossy, with soluble bitumen.

The arrangement of the constituent elements of the animal economy forbid the species of reorganization here alluded to. Animal organism, differing with the vegetable, contain within themselves materials entirely too valuable for purposes of reproduction, to be allowed by nature to remain so long in the earth unappropriated. As we have said elsewhere, in every decomposition, the constituent elements combined in such a way as most readily ministers to the formation of new organisms. Thus, in the decomposition of the animal, we have one constituent of immense value in reproduction, the nitrogen—when, upon the supposition that animal matter contributed to any extent to the formation of Petroleum, would be altogether lost, or unavailable for many ages, which is not in accordance with the workings of nature. She is entirely to skillful a workman to allow her materials to lie thus unappropriated for so many centuries. In Egypt, where bodies have been inhumed for thousands and thousands of years, no trace of oil has been discovered. It has been estimated that the earth has been dug up eight times to bury its dead. If animal matter be the source to which the formation of Petroleum is due, and if this estimation be correct, we should expect those deposits to be more numerous and prolific then we find them. But the truth is, that the decomposition of animal and vegetable matter are so entirely different, that it would be impossible for products of the same character to result from them. The decay of the animal is so complete, and necessarily so, as to leave no chance for the formation of hydro carbons to any extent. In the vegetable, the excess of material is carbon, the very thing necessary to the comfortable existence of God's creatures, and were it allowed to dissipate a decomposition as do the constituents of the animal, we should not at this day enjoy the means of warming our houses, cooking our meals, and lighting our streets as we do.

In the arrangement of the animal, in accordance with the wise laws of the Deity, all the constituent elements are of such a character that they are unable to remain in the simple state after decomposition, as in the vegtable. Even in vacuo the decomposition of animal matter can go on, as it contains the necessary oxygen to start and keep up decomposition. In all cases of the decomposition of organic bodies, the constituent elements will resolve themselves into gas, when companions for each element are at hand. We do not find vegetable matter forming Petroleum on the surface of the earth, where abundance of free oxygen is at hand, to combine with and carry off every atom of its carbon in the shape of carbonic acid; but find it abundantly in those situations where it cannot find oxygen in quantity sufficient, and its carbon is forced to combine with hydrogen, and, in the presence of salt, unable to secure even the hydrogen for a companion, but forced to remain single in the shape of coal. The animal, on the other hand, though undoubtedly obstructed in its decomposition by the presence of salt, will still decay and ultimately disappear. Except in the case of coal, simple bodies are rarely found in nature—there is no apparent use for them—and nature creates nothing that is useless. Gold, for instance, is one of the least valuable of metals for really useful purposes.

In the decomposition of the animal organism, which consists of the whole four elements, the carbon finds its most congenial companion in the oxygen, the hydrogen in the nitrogen, the sulphur in a portion of hydrogen—these form gaseous bodies; and even the solid parts, the bones, undergo ultimate co mplete decomposition; as they lie in the earth, a sufficiency of carbonic acid reaches them (by means of the rain water) to connect them into soluble carbonate of lime. True, in the coprolites we find undecomposed phosphate of lime, but they bear so little comparison to the vast amount of animal matter that has been in existence since the formation of the globe, that they cannot be considered as of value in the account. There is no doubt incidental formation of other bodies in the decomposition of the animal, such as cyanogen, but these also are insignificant in amount. In language rather more familiar than elegant, we might say, that, adopting the opinion held by Prof. Lesley and some others, with regard to the influence of animal matter in the formation of hydro-carbons, were these views correct, we might expect the ultimate resolution of this beautiful world into a grease spot.

Another and equally untenable position is held by Prof. Lesley as to the preservation of the reservoirs of Petroleum. He says: "The rise of the stratification from the Alleghany river towards Lake Erie, is a fraction of one degree. The original contents of the rocks have, therefore, been preserved. Not so with the anthracite basins on the southeastern side of the great coal area. Crushed, and upturned and overturned, contorted and fractured in every part, this part of the earth's crust has been dried and hardened, and exposed to chemical action from the superincumbent drainage waters, until its various formations (the coal beds included in the number) have been metamorphosed and partially re-crystalized. The oils which they contained have been lost by dissolution and evaporatian. The bituminous coals have become anthracites, and the last oil spring on the head waters of the Lehigh, the Schuylkill, the Juniata, the Potomac, or the New river ceased to flow many millions of years ago. In the West, on the contrary, in equally ancient, nay, in identically the same rocks, the Petroleum still remains, having had no outlet; always hermetically sealed and under pressure. It remains partly condensed in coal beds and black shales, partly distributed through the sandrocks and limestones, and partly filling up the joints which the shrinking of ages has produced. Possibly a small portion of it may be held in caverns through the more soluble limestones strata."

Possibly no conditions more favorable to formation of gas and pure carbon could exist than those of a substance like that from which Petroleum is formed, hermetically sealed, containing as it does a large per cent. of sulphur. Sulphur is, par excellence, the substance for which hydrogen has a high affinity. The sulphur, by combining with the hydrogen of the wood, would form sulphuretted hydrogen, the substance which is largely found in the retort in the process of making gas, (and the solid rock containing the Petroleum would be a most excellent representation of a retort, provided it be hermetically sealed), and yet the Professor says that Petroleum has been brought to the surface "partly by the gas it has itself generated, through natural fissures, producing oil springs, or through artificial augur holes." The substance is hermetically sealed, and has remained so for millions of years, he says, and is brought to the surface by the gas it has itself generated. If the Petroleum generated gas, there must have been decomposition going on, and if it were hermetically sealed, there could be no access of free oxygen. Now, if decomposition did go on, it must have been by the combination of the sulphur with the hydrogen, which would set the carbon free to form pure carbon, precisely what takes place in the retort of the gas maker. So that, instead of being preserved in the state of hydrocarbon, the Petroleum would the more readily be converted into anthracite.

The preservation of the oil is not due to the action of free oxygen, but to the controlling influences by which it is surrounded during its formation; and it counts for nothing that the rocks containing the Petroleum are of the same age as those containing anthracite. The upheaval and exposure to percolating water to which the coal beds have been subjected, are suffi-

cient to account for the presence of coal instead of oil, without the necessity of hermetically sealing.

The arguments used by Prof. Lesley would imply a belief that the coal and oil were substances of incidental formation purely, and that where the present stock became exhausted, mankind would be denied the comforts they now enjoy, whereas evidences in abundance are not wanting to show that both are forming at this instant as freely as at the beginning. Coal beds were no doubt formed many ages before man inhabited the earth, and the extent to which they exist goes to show that their formation is a part of the great system of nature. What would become of the globe and its inhabitants, were all the carbon contained in the vegetable matter on the face of the earth to go off into the atmosphere in the form of carbonic acid? The air would become so saturated with it, and its compounds, of carbon and hydrogen, as to poison and destroy every living thing! How wise, then, the laws regulating decomposition, whereby its products are made to assume shapes most favorable for reproduction! But had this hermetical sealing been carried on, in the course of the millions of years the Professor speaks of, the whole earth would have been little better than a sealed oil can.

The earth has its limits, and there is little doubt that, in the course of time, animal and vegetable matter equivalent to its whole bulk has had existence, has died, has been decomposed, and reproduced, "For dust thou art, and unto dust thou shalt return." This world was not made for to-day, nor for to-morrow, but possibly for all eternity. Accordingly we find that there is no diminution of the primary constituents of the different substances which go to make up the bulk of the globe. The carbon with which we have been cooking our meals and warming our houses, is again resolved into carbon, as coal or Petroleum. First becoming carbonic acid, on combustion, which is the food of plants—the plant separates the carbon and uses it in forming its own wood—this plant lives out its appointed time, sinks into the earth, and again resolves into carbon as coal or Petroleum. And so the round is kept up, dying substances furnishing the food of the living. In the animal, the processes of decomposition and reformation are of a more complex nature. The constituents of the animal do not go to form products under the earth for the future use of animals, but first become the food of the plant, which in turn becomes the food of the animal. But plants cannot eat bulky food, like animals. The principal part of their food is taken in in the shape of gas. They have no mouths to receive, no teeth to chew, nor stomachs to digest harsh food; consequently, their food must be in the highest degree soluble. In order to make the large amount of vegetable matter necessary for the food and fuel of man and animals, we see that it requires all the decomposing matter in existence. What, then, would be the consequence, were so large an amount of animal matter to be locked up for millions of ages as Petroleum or coal. If true it were thus stored, in the course of that time it would all be converted into Petroleum, whereas, by the true workings of nature, it is decomposed as soon as it dies out, and thus feeds generation after generation, until it gets into the state of coal, when it is again consumed, and again in the vegetable form, feeds the animal. On the other hand, were the animal matter to be resolved directly into oil or coal, it would only exist for itself, and this would be against the laws of nature. We live for each other!—the simplest and humblest plant has part and parcel in the existence of some other living creature more humble and insignificant than itself, or immensely greater and nobler. The poor little blossom that dies upon the tree, offers its life a sacrifice to the coming fruit. The humble daisy that glistens in the meadow, has a destiny—it lives not for itself alone—its constituent elements are wanted to assist in forming the next crop of grass, which is to nourish the cattle destined for our food. The grain of wheat, insignificant as it is, lives not for itself, nay, it contains the agent which will annihilate its present existence, in order that its constituents may furnish food for the new being bursting into life from its own bosom. How much more important, then, that animals should not be allowed to live solely for their own gratification. How necessary that they, too, should surrender up their constituent elements, in order that they may furnish food for the coming millions.

The coprolites will show to what extent deposits of dead reptiles have some times been made. What would have been the effect had these masses been resolved into oil? What a vast amount of nitrogen would have been left unappropriated. The coprolites are the remains of the bones of reptiles, and the fact of the absence of oil in their localities goes to show that the soft parts of the animal have been resolved into their original elements, and now form parts of other organized beings. The mere finding of a few animals in the bitumen does not prove that they assist in its formation, any more than the finding of toads in rocks proves that rocks are made of toads. An animal immersed in a substance like Petroleum would be not so likely to go into decomposition as one placed in vacuo—for an oxidisable substance of that kind would absorb all the oxygen the animal's body could supply, as well as keep off, mechanically, the free oxygen of the air.—*American Exchange and Review.*

HAVE YOU GOT OIL.

NOW YOU SEE IT—NOW YOU DON'T.

"Pearl hunting," reports this month a short newspaper paragraph, "is lively at Montpelier, Vermont. Over fifteen hundred dollars worth of pearls have been found in Winooski river and its branches within a fortnight." It is not many years since, that, in a waking dream, excitable people saw our meandering streams like threads, having occidental pearls at random strung. Some lucky wights, capturing the common mussels of fresh water creeks, discovered in them gems of wondrous ray; and every owner of a creek running through the alluvium upon which such mollusca exist, dreamed of a grand stock company for taking pearls, that should not only make him a millionaire, but elevate all his kindred into patricians. But the riches of Pearl creek in New Jersey and Pearl river in Maine, have passed as many a like vision, leaving behind a train of wasted labor, disappointed hopes and squandered means. We know not whether a new pearl fever, evanescent as the Jersy copper malady, will be excited by the gem-hunters of the Winooski, but we would counsel all such mussel seekers to remember that while the pearl yielding *unios* are of exceptional occurrence in many regions of both hemispheres, pearl fishing has been profitably pursued only within or near the tropics.

But as we began this article with a title that indicates that another natural wealth-giving product, first revealed by the streams, is our subject, it will doubtless be supposed, from what we have said, that we are now fairly under way with a lugubrious essay, seconding the fears of those who believe that ultimately petroleum wells will prove to be but a fizzle and a fallacy. The American frenzy for *morus multicaulis*, and the Dutch mania for tulips, have been cited over and over again as warnings to coal operators of the ruin which is ultimately to overtake them, and so we thought we would add another, and perhaps more pertinent instance, of speculative disaster, in order to discard its supposed intimations, just as we should announce our confidence in the general success of genuine petroleum operations. What has been cited like most other examples for admonition, has no analogy whatever with the subject of coal oil production, and therefore has no point or bearing in the case. The uncertainty which invests the geology of the reservoirs, the capricious disappearance and even appearance of the bituminous oil, have engendered apprehensions in regard to the permanence of the general yield, which will be likely to continue until more definite information is obtained with which to refute such unfavorable views. There are some capitalists, however, who remember that so the supply of coal was to fail in the days when the coal lands of Pennsylvania were first subjects of active speculation; and even our imperfect scientific knowledge, at least tells that the same grand, rich and mighty vegetation which by decomposition produced coal, also produced petroleum, and not only this, but other vegetation has afforded streams of earth-oil.

Now, we believe in oil; therefore are not to be classed with general oleaginous-keptics. But while we believe in oil itself, we are more than doubtful of many organizations working or not working lands. Even companies resting upon a good basis are in some instances peculiarly unfortunate in regard to some of the men connected with them, and who in a measure control the companies. Oil is slippery, and through its potent, lubricating power, gangs of men about town, trading Jeremy Diddlers, and characterless politicians, have greased their way and slidden into prominence. Oil is slippery. Now, Mr. stockholder, we therefore ask you the question, *Have* you got oil? Not merely is it struck in the rock, not merely has it been run into the barrel—Have *you* got oil?

There are many ways through which you may have not got oil, as there are many ways how not to do a thing. For example: A shrewd, clear-headed, unscrupulous speculator, whose sagacity has a steel strap spring, concocts and matures his plan. He finds a Venango county farm, or tract of land—it is not necessary that it should be supposed to contain oil; he bargains with its owners, and at a certain price obtains the refusal of the purchase for a specified number of days This done, a ring is formed. There are ex-members of everything, once as poor as Lazarus himself, who have thus enriched themselves. The Titan company is formed and by judicious and careful manœuvring, the prospects and claims of the company are magnified to a degree, that draws purchasers for the stock, as an open lantern attracts the gnats, and night flies of a swamp.

"We learn," says the Daily Puffer, "that the Titan oil well in Venango co., upon the left bank of Oil creek, is now yielding at the rate of 1,200 barrels, daily, The force of the jets was at first so great that many thousands of barrels were wasted, but by the use of the improved apparatus just put in operation by the Titan Company, the entire product of the well is secured.—The Titan well is, perhaps, the most promising in the entire oil region. It is believed to be inexhaustible." The verdant swallow such statements, without a single intelligent endeavor to verify their pretentious claims, and again the ring, and the friends of the ring, exult in the upward momentum imparted to the stock, and at the possession of the hot chestnuts that the credulous are raking out of the fire.

The "ring" reaps, however, the harvest; the stock is sold. The ring retains none for itself. Its friends obtain the company offices at fat salaries. Land is purchased, a well is sunk, and pamphlets tell of the huge yield of earth's bitumen to the fortunate company. The Titan bubble expands, and still expands. But it is hollow. The yield of oil is waning, perhaps there was none at all, or a well adjoining the Titan, sunk a few feet lower, drained it to dryness. The bubble grows thinner and thinner, yet, its prismatic hues lose none of their splendor, in the eyes of the incautious.

Perhaps, before the Titan shall explode, a connected concern, the Grand Basin, will burst. The latter was organized upon the homœpathic principle of the less the better. Its property consists in, the one-hundreth share of the sixteenth interest of the Bubble well, which produces exactly 10 quarts, per day, until it shall incontinentally stop.

Another way, in which you may not have got oil, we will illustrate by a few events of recent occurrence in Philadelphia. In this way, the oil may be too closely presided over, or superintended. It is just now, a moot question, whether it pays better, to be president or superintendent—especially the latter—or own the land. Of course the sagacious president and attentive superintendent go into the business extensively; and as the leasing of patches of land for a portion of the oil obtained, is one source of the revenue, leases have been made to the superintendent, by the president, of the best portion of the company's territory, just as the oil bearing character has been ascertained; in such leases the president also, of course, having a private interest.*

These leases, it is said, are sometimes worked with the company's money—we have heard instances in which the company's engine has been removed from the company's well, and put to work, on the private property of the superintendent.

Such presidents and superintendents operate in the shares of their own organization. When a good crop of stock has been got at low figures, the superintendent being at the oil land, telegraphs to the president, that a flowing well of 200 barrels per day has been struck—the telegraph is handed round, confidentially, of course; up and off goes the stock—suddenly, however another dispatch announces that, the well has stopped! and then what goes up, must come down.

A certain president was recently brought to grief. He had been operating in buying and selling stock on the "now flowing" and "now not flowing" dodge. His directors, some of whom had been victimized, examined his stock account. Not a single share was to his credit. The enterprising official was requested to resign forthwith.

For you (Orleans) repentance, absence and confession.

One superintendent refused $11 per barrel, offered for the company's oil, yet bought the oil on his own account at $10, and sold in a few days at $13.

Another superintendent claimed his right to sell oil, and use the money as he saw fit; should he have anything over to return to the company such surplus; the authority of the company to demand a statement of receipts and disbursements was ridiculous. He no doubt thought, too, the idea of there being anything over, the jolliest joke ever perpetrated in petroleumdom.

One superintendent is somewhat original in his ideas, and having formerly a pious status, always argues his case, when called to account by some energetic director, with clerical fervor and unction. Recently he was cornered. "Where's the balance of the oil?" asked a director: "Have not got it," was the response. "Then where is it?" "Gone to Heaven!" mournfully ejaculated the solemn pleader. We would rather have supposed that such a fiery product would have taken the opposite direction on its departure.

But, the matter is really too serious to jest about. There is too much at stake for trifling, too much, to allow the business to be at the mercy of sharpers. Honest men connected with this great interest, and knowing the abuses which are bringing it into disrepute, demand reform. It is imperatively necessary that there should be a change, in nearly one-half of the Philadelphia organizations. Especially, would we call upon gentlemen, whose names have been used as directors, not to allow by their remissness, an apparent endorsement, of transactions at which they would blush. A few years ago, reputable citizens found themselves in a very dubious position, by reason of their nominal connection with bogus insurance companies, then exploding, one after another. Philadelphia then bore the odium of being the great centre of insurance swindles; is she to be the great theatre of bogus coal oil operations? It is estimated that the city capital invested in oil shares, reaches $12,000,000, and it is daily increasing, and will continue to do so, unless its progress should be obstructed by what we have referred to. The question now is, shall interfering evils be got rid of, or shall they be dearly paid for?—*Amer. Exchange and Review.*

*There is frequently a thorough understanding between the president and superintendent. The superintendent experiments and tests the various localities of the property, and when he has made up his mind as to the best site for locating wells—which he does about the time he has expended the last dollar of the company's money—he proposes through the president to lease the said selected spots of the territory. The president has the leases prepared, calls his board together, and urges in view of the exhausted treasury, that the leases be granted. The board assent. The president (who is the private *partner* of the superintendent,) and superintendent both rejoice in a "big thing," whilst the stockholders have their certificates and a show of oil.

Failure in the Oil trade.—The London *Oil Trade Review*, gives us the following items of intelligence: Our Hamburgh correspondent, says: A great commotion has been caused on the Hamburg Exchange by the stoppage of a large commercial house connected with the oil trade. It is understood that the immediate cause of their suspension of payments was owing to speculations in rape oil and petroleum, which articles they had sold for forward delivery to a fabulous extent, hoping to cover themselves in the interim by purchases at a low figure. Hamburg merchants are the principal losers, but the London Exchange is interested to a considerable amount.

A correspondent has forwarded to us the following: Ibraila, August 11. A terrible conflagration broke out yesterday, in a large warehouse for crude petroleum on the banks of the Danube, about twelve miles from the town. The establishment belonging to an English co., has been completely destroyed, and the loss is estimated at from 200,000*l.* to 240 000*l.* The endeavors made to arrest the progress of the fire were useless, as it found every minute fresh material accumulated in these warehouses. Cast-iron tanks containing from 2000 to 3000 gallons of petroleum burst with a terrific explosion, and their ignited contents flowing on the ground extended the fire in all directions, until it covered a surface of upwards of 30,000 square yards. The bridge used as a landing dock and two barges were also devoured by the flames.

Coal Oil for Wounds.—An assistant surgeon, writing from the army, says that what water is to a wound in an inflamed state, coal oil is in a suppurating state—it dispels flies, expels vermin, sweetens the wound, and promotes a healthy granulation. He states that he has seen two patients whose wounds have been dressed with it, sleep before he was through with the third. This is a remedy easily applied in our hospitals. If it serves to keep away flies, it will add materially to the comfort of the wounded as well as their cure.

MINING.

PASSING UNDER A CLOUD.

The Pacific coast is passing through a panic of extreme severity. Business stagnates, stocks sink in value, people despair. What does it all mean? Whither does it tend? What is to be the result? The answer is simple. The war has not caused it, for those States which lie nearest to the seat of war exhibit a material prosperity and vigor such as has not been witnessed since the opening of the rebellion. The cause is local, to be sought for at home; to be explained by the conduct of our own people. The prosperity of the Pacific States depends largely upon the wealth of our mineral products. To destroy these would be very much like laying the axe at the root of the tree. Has this been done? Has the dreadful truth been made known that our mines are a sham, that our silver and gold are no more? God forbid! In every community will always be found a class of men who make it their business by apparently honorable means, to obtain a living out of the credulity and greed of their fellows. Men of this class swarm in the Bay city, overflow the precincts of Montgomery street, and elbow you in the Broker's Board. They are mostly men without means, and with but little more principle. Ingenuity, device, deceit, are their weapons. Their wallets are stuffed with mining certificates, they carry with them a little cabinet of specimens. Here is a specimen of ore taken hap-hazard, here is so much stock in the mine—you cannot make a better investment. The assessments will be light, if any; the mine will soon pay its way, and then your fortune is made. Now it is undeniable that hundreds of mines are incorporated by these people which have scarcely any existence, and often not even a locality. Any lithographer will furnish the certificates, and the specimens are readily obtained from bona fide mines, or carefully selected from paying ore. The principle is not a new one. You may find it more or less existing in all the industries of life. In the present instance it has been pursued with a vengeance. Thousands have been invested by the unsuspecting, whose minds have been captivated with the idea o rapidly accumulating fortunes, till at last the thing has run itself out. The blindness could not continue. The people found they had been imposed upon. Confidence was destroyed, and in consequence the whole fabric of our mining system is brought low. The good suffers with the bad, for men have no means of discerning the one from the other. They say if the Big Elephant be a lie, why may not the Gould & Curry and the Ophir be the same? And now we are lying for the time being, helpless beneath the incubus of want of public faith. And yet, what is the fact? Have these dishonest men the Alladdin's lamp, by which they can transmute the gold and silver veins of these mountains into dross? Will our shafts refuse to send up their bars of precious metal at their beck? Let any man fix a steady gaze upon this panic fear, and it will vanish like night before the sun. It is too unreal to have a continued existence. For, in truth, the metallic formations of our present and future prosperity lie deep and firm all around us. We do not yet know the half of their secret. What we should do is what every honest miner does, who is by his own hard toil working out his own independence. We should frown upon these worthless unprincipled men who are discounting honest labor, and casting suspicion upon these matchless mines, in their unworthy efforts to climb to wealth. And this can be easily done. Most men can readily acquaint themselves with the true prospects of a mining claim, and if this cannot absolutely be done they can at least exercise the same judgment they would exhibit in any other investment, and first of all, be sure of the character of the agent with whom they deal. In fine, there is no legitimate cause for the present lack of confidence in our mineral treasures; the fog is even now thinning away, and before fall, the Reese River district, at least, will be sending substantial arguments from its door which shall convince the world of her stability, and, by inference, of the wealth of this whole vast section of the country.—*Reise River Reveille.*

PURIFICATION OF GOLD.

At a meeting of the Chemical Society in London, some three years since, an interesting paper was read, on deteriorated gold, by Mr. M. Warrington. He found that a large quantity of gold sent from the Bank of England was singularly deficient in ductility: it was so "rotten" that it could not be rolled or subjected to the usual process of coining. He found by analysis that the specimen contained 92 per cent. of gold, 4 per cent. of silver, and 2 per cent. of tin, and a small proportion of antimony. The presence of this latter metal was supposed to be the cause of the alteration in the usual mechanical character of the gold, and it was no easy matter to extract it economically without loss of the precious metal. After several experiments Mr. Warrington found that oxide of copper when melted with the gold, in the proportion of about ten per cent. removed the antimony; the copper parting with its oxide to the antimony, which then rose to the surface as a powder, and could be cleared off. When, however, this process was attempted on a large scale by the metallurgist at the mint, it was not found to answer, and Mr. Warrington was again applied to. The gold had been melted in the usual black lead or plumbago crucibles, the carbon of which had combined with the oxygen, and thus prevented the proper action of the oxyd of copper on the antimony present. On the substitution of clay crucibles for those of black lead, the process was found to be very efficacious, and the difficulty was removed. Mr. Warrington having observed in the course of his paper that there was difficulty in accounting for the presence of the antimony, another member stated that when at the Australian gold fields, he noticed large quantities of almost pure antimony in veins close to the quartz from whence the gold was obtained, therefore there could be but little doubt how the gold became deteriorated. In papers read by other members of the society, they stated, as result of experiments on a large scale, that gold is to a certain extent volatilized during the progress of cupellation, a small proportion of the metal having been found deposited in

the flues of the furnace; and that gold is also in a slight degree soluble in pure nitric or nitrous acids. In the course of the discussion, after the reading of these papers, one gentlemen mentioned that he was in Australia soon after the introduction of quartz crushing machines, when he observed great difference in the amount of the produce of the amalgamated gold on different days; and on examining the "tailings," or refuse of the mill, he perceived a quantity of gold had passed through without amalgamating with the quicksilver. This led him at once to suspect that the surface of the gold was covered with some unctious substance that obstructed its combination with the mercury and on treating it with an alkali, he found that the metals readily combined. He consequently recommended the mixture of wood ashes with the powdered quartz, by which means the daily produce of gold has been equalized, and in some instances greatly increased. On afterwards subjecting the tailings to the same process, more gold was extracted from the refuse than had been obtained when the powdered quartz was first operated on.

Coal Fields in Brazil.—Mr. Nathaniel Plant, who has been surveying the southern province for the Brazilian Government, in his official report confirms the fact of a valuable and extensive coal field existing there, of which full details were recently laid before the Manchester Geological Society. The locality is on the extreme south, just on the border lands between Brazil and Uruguay, at a distance from the coast in a direct line of about sixty miles, but an extensive shallow lake intervenes, and the sea-board is made up of a vast extent of dangerous sands and low banks. The nearest point to which the coal approaches a port of embarkation, is about twenty miles above the mouth of the Jaquaro, so that water carriage exists from the Atlantic port almost up to the coal-fields. The area of the coal field is conjectured to be about 150 miles square. An engineer is at present surveying the district for the purpose of estimating the cost of a single line of tramway, an item of expense which must be comparatively small in going over a country which is described as being as level as a billiard table. The principal features of this coal-field, as far as it has been examined, consists in the great depth of some of the coal-beds and the facilities which it presents in a long escarpment for getting the coal by open quarying. A second coal-field lies away some hundred leagues to the north, near Porto Alegre, the capital of the province. A third coal-field has been discovered in the small province of San Catharine, lying N. E. of Rio Grande do Sul; it is reported to be a deposit of about 80 square miles, and lying far from the coast in a range of hills. It appears not to be so readily got at, nor is the coal so good and abundant as it is in the greater degree of Candiota. These are the first instances of coal having been found and examined in the great empire of Brazil, with its three millions of square miles of country. It is a most valuable thing to the Brazilian Government, who annually import for gas and steam purposes, 250,000 tuns of coal at 49s per tun. It seems to be a bituminous coal, and well adapted for steam purposes and smelting; it has also been successfully tested in the Rio gas works. The probability is that this is only the commencement of many discoveries of the kind in Brazil.—*London Artizan.*

Coal in Mont Cenis Tunnel.—At a recent meeting of the Manchester Geological Society, Mr. Joseph Dickinson exhibited a number of specimens taken from the rocks now being tunnelled through the Savoy side of Mont Cenis. They appeared generally to be from metamorphic rocks; and as yet, he believed, no granite had been touched upon. The most interesting mineral is coal, which is found associated with the metamorphic rocks. It has, he was informed, been cut through in different places in the tunnel. Between St. Michel and Modane similar coal is being worked to supply the district. In thickness it is as irregular as the rocks themselves. It is very similar to the Welsh anthracite. There is no regular dip at all in any of the rocks. In one part they stand up like a cone. As for the coal, it is impossible to say which is the roof and which is floor, as it is sometimes vertical, and it dips in such a variety of directions. The rock which adjoins the coal is of the nature of shale. There are no stratified rocks near— not more than the bedding sometimes met with in metamorphic rocks; neither is the limestone stratified, but it lies in large masses, the same as quartz. The masses are partially laminated, and the coal lies imperfectly bedded. Here and there the quartz and limestone, instead of taking the shape of solid rock, are like snow or flour, and are used in making the mortar for the tunnel.—*London Artizan.*

Faulkner's Electric Pit Signals.—These signals, the invention of Mr. John Faulkner, of St. Mary's-gate, Manchester, are so constructed as to give the winding signal from the bottom, and return signals from the surface of the shaft, and also for signalling on the levels or inclines by touching the part of the signal constructed, either a greater or lesser number of times, as may be arranged. This will be found to save much inconvenience to men working in the pit. The signals will also be found useful for warning the men to commence or cease work by so many rings of the signal, which will be heard all over the pit; also for signalling all hands in case of danger, or for any other cause. It is also adapted for ventillating doors, to indicate whether they are open or shut. For instance, if a ventilating door which ought to be shut is by neglect left open the signal is so constructed upon a self-acting principle, that it will ring off any hands with a tremendous noise until the door be closed. By a singular arrangement if a door which ought to be open is by any means closed, the signal will also ring until it be opened. If the door be only opened one-sixteenth of an inch it will set the signal at work with as great a noise as if it were left wide open. In order to show from what part of the mine a signal proceeds, a box or partition may be fixed in some conspicuous place, with a number for each part of the pit which it may be deemed desirable to indicate. These number plates are fixed by hinges so as to move in or out, and the electric wire is fixed to each number plate corresponding with that part of the mine which it represents. Thus when a signal is rung, the number of the part from which it comes is projected outwards. This invention, in fact, may be used for any purpose of warning or calling, or signalling in the pit, and it is to be observed that where any signal is touched it can be distinctly heard all over the mine.—*London Artizan.*

Nova Scotia Gold.—The product of the Nova Scotia Gold Mines is thus stated:

The chief Gold Commissioner's table state that in May in the several districts 115 mines were worked, 811 men employed, 2,031 tuns quartz crushed; yield of gold, 1,601 oz. 8 dwt. 11 grs. An additional crusher was erected at Waverly this month. In April, 111 mines were worked, 802 men employed, 1,483 tuns quartz crushed: yield of gold, 1,740 oz. 4 dwt. 18 grs. From the above it appears that the total yield of gold for the quarter ending 30th June, 1864, was 5,159 oz. 8 dwt. 8 grs. Total for the quarter ending 30th April, 4,010 oz. 18 dwt. 3 grs. Total for half-year ending 30th June, 1864, 5,193 ounces. Of course the above statements do not show the entire amount of gold produced; in fact, it is impossible to get an exact knowledge of the quantity raised, because much is secured in nuggets, which with rich specimens, do not pass through the crushers, and as it is from crusher returns that the table is mainly compiled, it is apparent that all the gold procured is not enumerated.

A new patent for Separating Silver and Gold from Lead.—Mr. Edward Beelback, of Newark, N. J., has obtained a patent for a new method of separating gold and silver from lead, which is thus described in his specifications:

I claim, first, melting the lead which contains the silver and gold in a furnace with an inclined hearth, and drawing it off into a kettle containing, or to contain, a proper quantity of zinc to take up its silver and gold, instead of melting it in the kettle, as and for the purposes herein described and set forth.

Second. Casting the mixture of lead, silver, zinc and gold, after it has been sufficiently stirred for the zinc to take up the silver and gold, into pigs or masses of suitable form and size to re-melt in the furnace.

Third. Placing these pigs or blocks of lead, zinc, silver and gold, in a furnance with an inclined hearth and then subjecting them to a low degree of heat, sufficient to cause the lead to melt and run off, but not sufficient to melt zinc, silver and gold.

Mining in Southern Sierra.—Mr. A. R. Bishop has exhibited to us some fine specimens of ore from the Occidental and Cox ledges, in Alleghany district, Southern Sierra. Upon the former a tunnel has been run in, from which has been taken about 100 tuns of rock, worth, judging from working tests of similar rock from the same vein, about $100 per tun. From the Cox ledge about 150 tuns have been taken out, worth, by estimates made from careful assays and prospects, from $60 to $150 per tun, exclusive of specimens. Mr. B. has recently sold a controlling interest in these two claims to a party of New York capitalists, who will proceed immediately to erect a mill upon the property.

In the same neighborhood is the Alsop company's claims, located on five different ledges and upon which five tunnels have been driven, each of which has struck its vein and brought to light a large amount of rock. This rock also looks and prospects well. These mines are located in the midst of a very rich quartz mining district, which is being rapidly developed. They are most favorably located for working, being capable of a natural drainage of from 500 to 1,000 feet, by running tunnels from the river level.—*San Francisco Mining Press.*

Accidents in Mines in England.—In the year 1863, there were 907 deaths caused by accidents in and about the coal mines of Great Britain, 226 less than in the year 1862. 163 of the deaths were caused by explosions of fire damp, 407 by falls in mines, 147 by accidents in shafts, 134 by miscellaneous underground accidents, and 56 by accidents at the surface. There were also in 1863, 91 deaths caused by accidents in and about the inspected ironstone mines of Great Britain, 14 less than in 1862; nine of these were from explosions of fire damp, 39 from falls in mines, 27 from accidents in shafts, 9 from miscellaneous accidents underground, and 7 from accidents on the surface. In South Wales one life was lost to every 45,390 tuns of coal raised, and that has been about the average of the last eight years; in Scotland the deaths are as low as six per 1,000,000 tuns raised.

Mines in France.—From recent statistical returns of the mineral riches of France it appears that the number of coal mines worked is 490; and of iron mines 202. Of other substances there are 247 mines; comprising graphite, bitumen, rock-salt, antimony, manganese, lead, silver, copper, tin and zinc isolated or in combination. The concessions of coal mines extend over 5226 square kilometres (each 247 acres,) in 47 different departments. The mines of ironstone embrace an area of 1243 square kilometres, and lie in 31 departments.

Irish Mining Company.—The report of the Mining Company of Ireland, which was read at its recent meeting, showed a net profit of £19,373 on the last half-year, yielding a dividend of 22½ per cent. per annum, free from income-tax. The chairman, Mr. F. Codd, stated that it was the most satisfactory record that had ever been presented by a mining company. The Knockmahon Copper Mines, in the county of Wexford, yielded nearly £15,000 net profit, and the quality of the ore continues to improve as they go down into the great lode.

Gold Production.—M. Chevalier, whose treatise has been translated by Mr. Cobden, says that there was as much gold extracted from the mines of the world within the ten years which followed the year 1848, as during the 366 years preceding—that is to say, during the

whole time that America has been known to Europeans. During the three and a half centuries which preceded the discovery of the California mines, the whole amount of gold brought to the markets of Christendom was $2000,000,000, while the annual receipt is now about $205,000,000, from all sources of supply. Humboldt estimated that, at the commencement of the present century, all the countries from which Christendom drew its supplies of gold produced annually about $17,000,000, and M. Chevalier estimates that, of this amount only about $12,000,000 found its way into Christendom In sixty years the annual production has risen to more than $200,000,000, and the annual addition to the stock on hand in the Christian States, to nearly $19,000,000. If these estimates are correct, the amount of gold in the States of Europe and America was nearly doubled between the years 1848 and 1858—or allowing a few years for the development of the mines, it would be safe to say, that the quantity of gold now in the Christian world is twice as great as it was when the California mines were discovered in 1848.

GAS.

CRYSTAL PALACE DISTRICT GAS COMPANY.

ANNUAL TREAT TO THE WORKMEN.

We take the following description of the annual treat given to the "Crystal Palace District Gas Co.," which is located in one of the districts of the city of London, from the *South London Journal* of Sept. 3d.

The directors of this Company, anxious to promote the happiness and social enjoyment of the men employed at their works, also in the distribution of the gas, have for some years past made it a practice of giving them one day's relaxation from the toils of labor, and providing them with the means and appliances necessary for their recreation. In order also, that nothing shall be lacking to afford the employees a real day's enjoyment, the married men are allowed to be accompanied by their wives and families, and those in the bachelor estate have the privilege of introducing to the pleasures of the day, the young ladies of their acquaintance whom they hope one day to lead to the hymeneal altar. As taking the whole of the men away from the works at one time would result in great inconvenience, two parties are arranged, and the first had their day on Monday last. The Crystal Palace, as representing the most varied attractions, is generally selected as the place for enjoyment, and it was so on this occasion. The party assembled at Bell-green at half-past eight in the morning, and Mr. M. Ohren, the secretary and manager, had provided vans for a drive round the beautiful neighborhood previous to entering the Palace. After the magnificent scenery which abounds in the district supplied by the Company had been viewed, the vans drove up to the entrance of the Palace. A substantial dinner was provided at one o'clock in one of the dining saloons, over which Mr. M. Ohren, presided supported by Mr. Good, foreman at the works, and Mr. Boocock, district inspector. Mr. Coxwell, the celebrated aeronaut was also present, and likewise Mr. Warry the gentleman specially employed by the City Mission ary Society to labor among men employed at gas works. After the substantial had been disposed of wine was introduced, and

Mr. Ohren, rising, said it was usual at public dinners to propose several toasts, commencing with "the Queen" then "the rest of the Royal Family," and afterwards the "Army, Navy and Volunteers." He had no doubt if he proposed those toasts that day they would receive a most hearty and enthusiastic response, but it was not the practice to drink but one toast at their gathering, so that there might be a longer time to enjoy the varied attractions of the Palace. The only toast it was customary to drink, was, "Success to the Crystal Palace District Gas Company" (cheers.) On this occasion he should, however, ask them to drink it with a slight alteration, and that was the "continued" success of the Company (applause.) For the Crystal Palace Gas Company had been successful, and not only had it been successful with regard to the shareholders, who received the highest dividend allowed by Act of Parliament, but it had been equally as successful for the interests of the consumers. This was proved by the fact that when the Company first began operations the price charged for the gas was 6s. per thousand feet, and the price had been reduced on several occasions, thus giving the consumers the benefit of the success in the undertaking, till at that moment it was 4s. 10d. per thousand. And, as a further proof that he was justified in asking them to drink continued success, was that he was actually having notices printed intimating that on and after the 1st of January, next year, the price would be 4s. 9d. per thousand, thus bringing it within threepence per thousand of that paid in the city. This, when it was considered that there must be extra expenses attendant in a suburban district, must be considered most satisfactory to every one interested in the concern. Mr. Ohren then pointed out the various attractions in the Palace and grounds that day, particularly alluding to the balloon ascent by Mr. Coxwell, advising them as they had assisted in the manufacture of the article which enabled the balloon to ascend they should see the method of filling it. He concluded by giving the toast, "Continued success to the Crystal Palace District Gas Company" (prolonged cheering).

At seven o'clock the vans drove up, and conveyed those who did not wish to remain any longer at the palace to the works, and so ended the day's excursion.—Those who were employed at the works on last Monday have their excursion on Monday next, when similar arrangements will be made.

Position of Gas Companies in England.—In evidence given before the committee sitting on the Birmingham Gas Companie's Bill, the following statistics with regard to the present position of gas companies was quoted. The metropolis has thirteen companies, with a gross capital of £5,272.279, and a gross revenue of £1,836,946. The meter rental of the thirteen companies is £17,330; the gas expenditure, £1,333,305; the annual reserve, £32,506; the cost of coals, £707,783; and the residual product, £310,173. The price at which the gas is sold varies from 4s. 6d. to 6s. per thousand feet, and the average dividend paid by the companies is 10 per cent.

The Liverpool United Gas Company has a shareholder's capital of £529,900, a gross revenue of £204,393, a meter rental of £20,279, and a gas expenditure of £137,562. The price charged for gas varies 3s. 5d. to 3s. 9d., and the dividend paid is 10 per cent.

The Manchester Corporation Gas Works has a shareholder's capital of £397,450, a gross revenue of £161,416, a meter rental of £244, and a gas expenditure of £106,570, exclusive of depreciation. The price charged for gas is 3s. 9d. and the amount of the annual reserve £12,179.

The Bristol Gas Light Company has a shareholder's capital of £24,000, a gross revenue of £68,046, a meter rental of £1,466, and a gas expenditure of £51,405. The price charged for gas is 3s. 9d., and the amount of the annual reserve £2,000.

The Wolverhampton Gas Company has a shareholder's capital of £81,168, a gross revenue of £25,902, and a gas expenditure of £1,741. The dividend paid is 10 per cent., and the amount of the annual reserve £750.

The Birmingham Gas Light and Coke Company has a shareholder's capital of £211,700, a gross revenue of £87,330, and a gas expenditure of £70,985. The price charged for gas is 3s. 4d. and 2s. 8d.

The Birmingham and Staffordshire Gas Light Company has a shareholder's capital of £357,900, a gross revenue of £147,228, and a gas expenditure of £107,447. The price charged for gas is 3s. 4d. and 2s. 9d.

Continental Union Gas Company, England.—A prospectus has been issued of the Continental Union Gas Company, with a capital of £400,000, in shares of £20, to carry on and extend the business of gasworks now in full operation, with exclusive privileges at several of the principal towns of France and Italy, including Strabourg, Cette, Nimes, Milan, Genoa, Parma, Modena, and Alessandria. These works belong to a society called the "Union des Gaz," and are to be held by the present company under lease for twenty years, when the company will share with the Union des Gaz the entire possession of the property. The directors and auditors are all persons of the highest experience in this department of enterprise, and the calculation is that by bringing the best modern system to bear upon the working of the undertaking the receipts may year by year be augmented in an almost uninterrupted proportion. The brokers are Messrs. Hill, Fawcett, and Hill, of London, who have also been long connected with leading gas companies.

Improved Manufacture of Gas.—A well known gas engineer in London proposes that the manufacture of gas be partly carried on in the immediate vicinity of the mines. Here the coal is to be submitted to distillation in the simplest manner, and the product collected in the form of coal oils; the oil so obtained may then be submitted to purification from the nitrogenous and sulphur compounds, which are so fruitful a source of complaint when they find their way into illuminating gas, it being thought far easier and cheaper to remove all the nitrogen and sulphur from a gallon of coal oils, than from the one hundred and fifty, or two hundred feet of gas of which it is the representative.

When the oil has been properly prepared and purified from all deleterious substances, it is to be conveyed to the place where it is needed, and there converted into gas. The work necessary for this purpose need only consist of a few retorts and a gas-holder or two. The retort being heated to redness, a little of the oil is allowed to flow into it, when instantly it is converted into permanent gas, and carried through a pipe into the gas-holder of the ordinary construction, from which the illuminating gas is supplied to the mains, as heretofore.—*American Artisan.*

Luting for Gas Retorts.—The luting commonly used for gas retorts, consists either of loam or clay, or a mortar made of the refuse lime from the purifier, and after having been once used is useless, and has to be carted away at considerable expense. As large quantities are, required, a considerable saving of expense can be effected by rendering it fit to be used over again. The object of this invention is to effect this saving; and to this end it consists in taking the luting material which has been used, grinding it or otherwise reducing it to a plastic state with a sufficient quantity of water and adding a small portion of fresh clay and graphite. To the loam or clay luting, a small quantity of fresh lime is also added, but for the lime luting this is not necessary. By regrinding and adding the clay and graphite, the same luting may be used over many times. The quantity required to be added varies from one-eigth to one-twentieth part of the weight of the luting. John Chilcott, of 70 Fulton st., Brooklyn, is the patentee.—*American Artisan.*

WATER.

WATER-WORKS IN ENGLAND

Rotherham.—The accepted contracts for the construction of the New Water-works were read over at a recent meeting of the Local Board of Health. Messrs. Chadwick & Thirlwall, of Mosbro', builders, have been entrusted with the masonry work, laying pipes, &c. The contract, which amounts to about £3,000, stipulates that the whole of the works shall be completed in six months; a penalty of £5 per day being inflicted for every day that period is exceeded. The contract of the Stavely Iron Company for the supplying of cast-iron pipes amounts to nearly £6,000. The contract of Messrs. Chadwick & Thirlwall does not include the constructing of the large reservoirs at Packman's Bridge. For the present, filtering beds only will be made there. There will be a small reservoir at the junction of the two streams near Whiston. The Board have not yet ascertained what they will have to pay for possession of the land through which the pipes will be laid, nor how much will be required to meet the claims for compensation. The clerk was instructed to get the contracts signed by the contractors.

Wigton.—A large and influentially-attended meeting

has taken place here, for the purpose of considering upon the desirability of supplying the town with water by means of water-works, and to hear a report upon the best means of doing the same, prepared by Mr. Hawksley; also to hear an explanation of the Local Government Act, 1858. The feeling of the meeting appeared to be almost unanimous in favor of water-works and of the report, as also of the adoption of the Local Government Act, 1858, under which the proposed works could be established, and any other requirements in the town carried out. Mr. Hawksley's report states that experience has shown that the summer delivery from well-managed water-works, for a population such as is located in Wigton, may amount to 25 gallons per head per day, which, to a population of 6,000, would be equal to 150,000 gallons per day; that the river Wiza offers all the facilities for the realization of the proposed undertaking The estimated cost of works and land is £5,335, or, with preliminary and Parliamentary expenses, £6,000. The annual income is estimated at £500, the annual expenditure £170, leaving £330 for profit, being about 5½ per cent. upon the gross capital.

Scarcity of Water.—The Sheffield water-works company have found it necessary still further to reduce the supply of water to the town, in consequence of the drought; as, with a continuance of the present dry weather, the reservoirs would in the course of a few weeks become entirely empty. The directors have given notice that the supply will only be given every alternate day. There are complaints of scarcity of water from all parts of the country; and it is to be feared that the drought will bring ill health upon the community ere the close of the year. A memorial has been presented to the Home Secretary on the subject, as regards the general drainage of the country, though it is not easy to see what he can do towards remedying the evils which are pointed out. The memorial, however, prays for an inquiry into the water economy of the country. It is said that Asiatic cholera has occurred in the Lincolnshire fens from the drought, which has reduced the marshes to the state of stagnant pools. —*London Builder.*

Consumption of Water.—A man is generally supposed to require about half-a-gallon of water per day for drinking, cooking, &c., and about four gallons more for washing, bathing, and other purposes; a family of five heads will require about nine gallons per day. In Paris, the consumption of this liquid is officially stated to be

4½ gallons for every man per day.
16½ " " horse "
9 " for a two-wheeled carriage per day.
16½ " " four " " "
92 " for every square yard of garden per annum.
66 " for a bath per day.
¼ " for every square yard of public road per day

The consumption in Madrid, according to the report of the directors of the Canal de Isabella II. Company, is

5½ gallons for every man per diem.
21½ " " horse "
14½ " " two wheeled carriage per diem.
21½ " " four " "
12 " " square yard of garden "

The following is the consumption, in gallons, of water, per day and individuals, in the chief towns of Europe and America:

Rome, 243; New York, 125; Marseilles, 103½; Besancon, 54; Dijon, 44; Bordeaux, 37½; Hamburg, 28; Genoa, 26½; Madrid, 26; Glasgow, 25; London, 24½; Cette, 23; Lyons, 19; Manchester, 18½; Brussels, 17½; Monaco, 17; Toulouse, 16½; Geneva, 16½; Narbonne, 16; Philadelphia, 15½; Paris, 15; Grenoble, 14½ Montpelier, 13; Nantes, 13; Voiron, 12; Clermont, 12; Edinburgh, 11; Havre, 10; Angouleme, 9; Liverpool, 6; Metz, 5½; St Etienne, 5½; Altona, 5½; Constantinople, 4½; Rio de Janeiro, 2.

This statement only comprises the quantities of water supplied by aqueducts; those yielded by wells and other means are not easy to ascertain.

Water Supply of Naples.—The authorities at Naples are about to introduce a new supply of water for the use of that city. Mr. Bateman has reported on the project, which is to cost £750,000. The water is to be conducted to a distance of 47 miles, and the quantity to be served per head of the population is 20 gallons per day. The present supply is about eight gallons per day.

Water Supply of Paris.—The new steam engines at the Quai d'Austerlitz, which increase the supply of the suburban districts of Paris by 4,842,000 gallons of pure water per diem, drawn above the level of Paris, are now fully at work. The engines are 120-horse power each, and are designed to feed two covered reservoirs at Gentilly and Charonne, of a capacity of respectively 1,099,000 and 1,318,800 gallons. From Gentilly, the water is led to Troy, Gentilly, Montrouge, Vaugirard, and Grenelle. The Charonne reservoir supplies Bercy, Charonne, Belleville, la Villette, la Chapelle, Montmartre, and les Batignolles. The excess of the two reservoirs is conducted into those of Passy and Chaillot.—The object of these reservoirs is, on one hand, to cause the pumping engines, which are single acting, to work at a constant pressure, and, on the other hand, to regulate the distribution of the Seine waters by means of a constant supply, which may amount to 8,154,580 gallons. This capacity is distributed over five compartments, viz., three lower ones, whose timber frame rests on the ground, and two upper ones mounted on two of the lower ones. One of the upper basins is especially devoted to the supply of the Bois de Boulogne, while one of the lower ones is always kept full to serve in case of fire. The Chaillot engines raise the Seine water through two compression tubes of 2 ft diameter into the Passy reservoirs; the latter find now an additional supply from the engines of the Quai d'Austerlitz. These pumping engines have been designed and executed by Messrs. Farcot and Co., of St. Ouen.

The Dublin Waterworks.—The chief features of the water-works at Roundwood, are a great storage reservoir, having an area of 400 acres, capable of holding when filled, 2,482,810,483 gallons of water, or a 200 days' supply for Dublin, 12,000,000 gallons daily; a vast embankment, some 4,600 ft. in length; greatest height, 66 ft.; the depth of water inside, which will be about 60 feet; and a covered conduit pipe and tunnel, together three miles in length. In the construction of this tunnel, some expected engineering difficulties have been met, in consequence of which the contractor has been allowed a year additional. The embankment is 500 ft. wide at the base, and 22 feet at the top. It is a mountain of puddled earth, faced with granite. The cost of the works will be about £280,000; 1,500 men are employed upon them, and it is expected that they will be completed by January, 1865.

North Brazil Water Company.—A prospectus has been issued of the Céara (North Brazil) Water Company, with a capital of £60,000 in shares of £10, to purchase and carry out a concession granted by the local government of the Brazilian province of Capitania, for supplying the city and port of Ceara with water at a stipulated tariff The concession is for 50 years, and the price to be given for it is £10,000 in paid-up shares.

MEDICINAL PROPERTIES OF SILK.

Neumann found that but few materials afforded as much volatile alkali as silk. Tourneyfort observes that silk contains more than hartshorn, as he obtained from fifteen ounces of silk two drachms of volatile salt; this which was called the spirit of raw silk, when rectified with some essential oil, was the medicine formerly celebrated under the name of "Guttæ Anglicæ,' or English drops. The volatile alkali obtained from silk was then supposed to be of a different nature from that contained in any other substance, and it consequently was held to possess different virtues peculiar to itself.

A silk covering of the texture of a common handkerchief is said to possess the peculiar property of resisting the noxious influences and of neutralizing the effects of malaria. If, as is supposed, the poisonous matter is received into the system through the lungs, it may not be difficult to account for the action of this simple preventive. It is well known that such is the nature of malaria poison that it is easily decomposed by even feeble chemical agents. Now it is probable that the heated air proceeding from the lungs may form an atmosphere within the vail of silk, of power sufficient to decompose the miasma in its passage to the mouth; although it may be equally true that the texture of the silk covering may act mechanically as a non-conductor, and prove an impediment to the transmission of the deleterious substances. We learn from Pomet's history of drugs that silk was in his time used as a medicine, by reducing the pure part of the cocoon into a powder, and duly and carefully separating the chrysalis from the part which he considered medicinal. Silk, thus prepared, has, as he affirmed, "the virtues of cleansing the blood, making the spirits brisk, and the heart pleasant." Lenory, the editor and commentator of Pomet, adds that the silkworm itself likewise possesses medicinal properties. According to his information, silkworms that had been dried into a powder and applied upon the head (which should be previously shaved for the reception of this plaster) were extremely efficacious in curing vertigo —*American Artisan.*

FEATHER BEDS.

The sanitary effects of the various materials used for beds is a subject which has been too little considered. The old established institution, the feather-bed, has its comforts, and with those who have been long accustomed to it, it has become an actual necessity. In the Anglo Saxon days warm beds were a desideratum in every well arranged household; and since then, through the Mediæval Ages up to the present time, beds, bedsteads, and bed furniture have been matters of importance in connexion with every household. The unwholesome curtains have now nearly gone out of use,—a change in fashion which is conducive to health; with those of the rising generation, the feather bed is decidedly going out of favor; and, generally, the medical profession do not speak in its praise, and before long it is likely that feather beds will be disused in the hospitals. By some good housewives the cases of the feather beds are changed, at the least, once a year; the feathers which have massed together in lumps are separated' aired, and then placed in a clean covering. This is a wholesome method, but it is by no means an uncommon custom to leave the feathers in the same case unopened for many years together,—a practice which is very reprehensible. Besides the ill effects which may arise in this way, there is now an opinion, strongly expressed, that very soft and yielding couches are not good for health or proper muscular development, and are, therefore, improper for use in schools and places in which the youth of both sexes are reared. Up to the end of his life the Duke of Wellington slept on a hard narrow mattress; and others might be mentioned who have lived to an advanced age, who repudiated soft beds.

A variety of materials is used for the stuffing of beds. There are the sweetly-scented heather beds in Highland cottages, which when carefully and frequently renewed afford a pleasant resting place for the weary traveller. In some parts, various species of the fern are employed for the same purpose. In some of the English regiments, the soldiers fill the bedticks with clean dry straw: this, when neatly put in regular layers, is said to make a comfortable and wholesome bed. The straw is changed once in a fortnight; and what has been put aside from the barrack room can be used in the cavalry stables. In London, and other large towns, a material called "flock" is extensively used for stuffing beds,—This should be often changed and cleansed. In many of the dwellings of the poor we have met with beds filled with wood-shavings: a filling of this kind for a bed can be had for about 4d.; and if the material is often renewed there is no harm in it: but, unfortunately, this is not done; and often these beds fall into shocking conditions. Horse-hair and spring matresses have in many instances been substituted for feather-beds; and some have carried the liking of hard beds to such a degree as to sleep on flat boards; this, how-

ever, will not generally come up to the idea we have of a bed of roses.

As regards beds in a sanitary point of view, there can be no doubt that the use of feathers in excessive quantities is not beneficial to health: and that the materials used for stuffing should be frequently changed. Some have suggested that any substantial filling for beds may be done without altogether, by the use of gutta-percha bed-cases, filled with air. We have no estimate of the difference of cost between first class feather beds and those of gutta percha which can be inflated; but in some respects, provided that the cost did not forbid it, air-beds filled to a proper consistency would have advantages.—*London Builder.*

FORCE OF TORNADOES.

The force with which tornadoes move is well illustrated by an occurrence which recently transpired on a western railroad. An entire train was blown bodily from the track, causing severe injuries to the passengers. The *Cincinnati Gazette* gives the following account of the disaster:—

"The 4:20 train on the Indianapolis railroad, which left this city Friday afternoon for Chicago, was blown from the track, at a point near Wirtnell's Bridge, 15 miles below Lawrenceburg, by one of the most terrible tornadoes that has ever visited this section of country. As the train approached the bridge above-named the atmosphere seemed filled with branches of trees and missiles of various kinds the wind had taken up in its path, and the engineer, thinking the bridge unsafe, increased the speed of the engine so as to reach the protection of the hills beyond. He was too late, for the hurricane, resistless in its energy and overwhelming in its power, lifted the entire train into the air and hurled the rear portion of it over a steep bank, the baggage car, which was very heavily laden, being whirled diagonally across the track and the rear of the first passenger car, still occupied, being suspended over the precipice at the side of the track. The train which happened to arrive at such an untimely moment, in the very focus of the wild hurricane, was heavily loaded with passengers, many of them bound to the Chicago Convention; yet, strange to relate, notwithstanding the increased speed with which the train was moving and the height of the embankment down which the cars were hurled, not one person was killed. This may be considered a most miraculous escape, two of the cars being completely wrecked and jammed to pieces; the seats dislocated and shattered to fragments, and everything left in the most chaotic condition. From thirty to forty individuals were more or less injured, and two ladies, names not known, probably fatally, one of them it is thought, having suffered a dislocation of the spine."

OLD THINGS.

Give me the old songs, those exquisite bursts of melody which thrilled the lyre of the inspired poets and minstrels of years ago. Every note has borne upon the air a tale of joy and rapture—of sorrow and sadness. They tell of days gone by, and time hath given them a voice which speaks to us of those who once breathed and sang those joyous old melodies—of what they now are and what we soon shall be. My heart loves those melodies; may they be mine to learn till life shall end, and as I "launch my boat" upon the sea of eternity, may their echoes be wafted to my ear, to cheer me on my passage from the scenes of earth and earth-land.

Give me the old path, where we have wandered and culled the flowers of love and friendship in the days of "Auld Lang Syne," sweeter, far, the dells whose echoes have answered to our voices; whose turf is not a stranger to our footsteps, and whose rills have, in childhood's days, reflected back our forms and those of our merry playfellows, from whom we have parted, and meet no more in the older nooks we loved so well.—May the old paths be watered with Heaven's own dew, and be green forever in my memory!

Give me an old house, upon whose stairs we seem to hear light footsteps, and under whose porch a merry laugh seems to mingle with the winds that whistle through old trees, beneath whose branches lie the graves of those who once trod the halls, and made the chambers ring with glee. And O! above all, give me the old friends—hearts bound to mine in life's sunshine hours, and a link so strong that all the storms of earth might not break it asunder—spirits congenial, whose hearts through life have throbbed in unison with our own? O, when death shall still this heart, I would not ask for aught more sacred to hallow my dust, than the tear of an old friend. May my funeral dirge be chanted by the old friends I loved so fondly: who have not yet passed away to the spirit's bright home!

IMPURITIES IN THE ATMOSPHERE.

Some curious facts have lately been developed in reference to the impurities floating in the atmosphere. Mr. J. Samuelson has been investigating the traces of animal life in the dust of the air, and gives the following as part of the result of his observation:

"He had taken rags imported from various countries and shaken the dust from them into distilled water, which he then exposed to the atmosphere; and after describing generally the character of the living forms he had discovered in this pure water, he stated in detail the forms of life found in each kind of dust, and among them were some new species of rhizopoda and infusoria, and an interesting ciliated, worm-shaped form, which he believed to be a collection of the larvæ of some other infusoria. The general result of the microscopical examination of these fluids was as follows: In the dust of Egypt, Japan, Melbourne, and Trieste, life was the most abundant, and the development of the different forms was rapid.

In conclusion, he observed that if he was correct in supposing the germs of the living forms that he had described to be present in the dust conveyed by the atmosphere, and in distilled water, it was worthy of notice that these germs retain vitality for a long period, of which he could not pretend to define the limit. In his experiments they outlived the heat of a tropical sun and the dryness of a warm room during the whole winter; but in Dr. Pouchet's case they retained their life 2000 years, for he obtained his from the interior of the pyramids of Egypt, and they survived an ordeal of 400 deg. of heat. He suggested whether the great rapidity with which these germs are multiplied might not account for the spread of epidemic diseases. He did not profess to have any acquaintance with such diseases; but might it not be desirable to subject the atmosphere of hospitals to the microscopic test?"

Professor Wyman, of Cambridge, has published an account of other kinds of bodies which he found in the dust floating in, or deposited from the atmosphere:

"The dust was obtained either from the floor of an unoccupied attic, or from plates of glass covered with glycerine and exposed to currents of air. The organic matter detected by the aid of the miscroscope consisted of various minute fragments of vegetable tissues, such as wood-tissue; spiral-ducts, hairs, pollen, etc. A few starch granules, resembling those of wheat, and giving the usual reaction with iodine, were occasionally found.

In dust from an attic over a frequently occupied college recitation room, human cuticle and epithelium scales from the mouth were detected. The lecture-room and attic communicated freely by a ventilator. There were also found, less frequently, however, various spherical bodies; some of them spores of cryptogamous plants, and others resembling the eggs of some of the smaller invertebrate animals. Professor Wyman was unable to identify the bodies in question, except that in one instance he detected the spores of a confervoid plant. As these were found before the conferva were begining to be developed, it is probable that they came from plants of the preceding year, and had been carried about by the winds after the drying up of the stagnant pools, in the latter part of Summer or Autumn. Some of the egg-like bodies appeared to contain an embryo, which could not be referred to any particular species.

One of the spores detected was especially interesting from its resemblance to pus and mucous corpuscules; so close was the resemblance that one might be readily mistaken for the other. The fact is important, when considered in connection with the recent attempts made in Germany to establish the presence of pus in the atmosphere, and in this manner explain the transmission of certain forms of disease. The existence in the atmosphere of a large number of spores of cryptogamia, gives a probable explanation of the transmission of certain of the algae and fungi, which infest the bodies of men and animals."

THE PRESS—WHAT IS IT?—The realm of the Press is enchanted ground. Sometimes the Editor has the happiness of knowing that he has defended the right, exposed the wrong, protected the weak; that he has given utterance to a sentiment that is not lost—a sentiment that has cheered somebody's solitary hour, made somebody happier, kindled a smile upon a sad face, or hope in a heavy heart. He may meet with that sentiment months, years after; it may have lost all traces of its paternity, but he feels an affection for it. He welcomes it as a long absent child. He reads it for the first time, and wonders if, indeed, he wrote it, for he has changed since then. Perhaps he could not give utterance to the sentiment now; perhaps he would not if he could. It seems like the voice of his former self calling to the present, and there is something mournful in its tone. He begins to think, to remember—remember when he wrote it, and why; who were his readers then, and whither they have gone; what he was then, and how much he has changed. So he muses, till he finds himself wondering if that thought of his will continue to float on after he is dead, and whether he is really looking upon something that will survive him. And then comes the sweet consciousness that there is nothing in the sentiment he could wish had been unwritten, that it is the better part of him; shred from the garment of the immortality he shall leave behind him, when he joines the "innumerable caravan," and takes his place in the silent halls of death.—*Chicago Journal.*

BOOTS.—Russia gives us as good a hint for the management of our feet, as for the management of our head and very serviceable things much used there and little known in England, are double boots, coming up just about the anckle and outside the trousers. Being made easy, they enable a person who has walked through muddy streets to enter a house with perfectly clean feet and trousers, so that he neither soils marble staircase nor velvet carpets. They are provided with a little brass screw behind, which looks much like a spur, but serves in reality to take them off by merely pressing the foot upon it. The old Hessian boot may be so made also as to serve a similar purpose very gracefully.—*All Year Round.*

A THOUSAND OIL WELLS IN WEST VIRGINIA.—The Wheeling (Va) Intelligencer says: "We learn from a gentleman who is interested in an oil well in Pleasants county, that the excitement runs very high down there. On Horse Neck, French, and Cow creeks there are nearly a thousand wells in progress. One cannot ride any considerable distance, even in the most obscure places, without coming upon an engine puffing away and driving a shaft into the bowels of the earth. On the Ohio side of the river the same excitement prevails, and a large number of wells are being bored. Upon, an average there are about ten men at each well which fact will give the readers an idea of the immense amount of money and labor that is being employed in the search for oil. A majority of the operators are from the Eastern cities, and some of the companies are immensely rich.

THE TAXES ON ONE FIRM.—The Coal Oil Circular gives a long description of the works of a firm engaged in refining petroleum in the oil region of Pennsylvania, and states that the taxes which this firm will pay to the United States Government will amount to $1,200,000 per year.

THE AMERICAN GAS-LIGHT JOURNAL AND MINING REPORTER is published on the 2d and 16th of every month, and is a recognized official organ of—

LIGHT, HEAT, MINING INTERESTS.

PETROLEUM, WATER-SUPPLY, AND SCIENTIFIC SUBJECTS GENERALLY.

JAMES W. BRYANT, EDITOR AND PROPRIETOR.

W. S. SHERMAN, PUBLISHER.

PROF. C. ELTON BUCK, CONSULTING CHEMIST.

SUBSCRIPTION—Three dollars per annum in advance.

ADVERTISEMENTS.—One dollar per inch in column for each insertion. A discount of 10 per cent. allowed when inserted for three months; 25 per cent. when inserted for six months; and 50 per cent. if for one year.—Payable in advance.

☞ All communications to be addressed to "The Editor," No. 15 Nassau Street, New York.

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THE
AMERICAN GAS-LIGHT JOURNAL,
AND
MINING REPORTER,

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JAMES W. BRYANT, ... EDITOR.

MONDAY, OCT. 3d, 1864.

BACK NUMBERS WANTED.—We want to complete our files of the Journal, the following numbers, for which we are willing to pay full price.

Vol. II—No.'s 13, 22, 24, 25, 29 and 34.
Vol. III—No.'s 40, 42, 44, 47, 48, 52 and 56.
Vol. IV—No.'s 63, 64, 67, 68, 69, 70, 72, 74, 80, 82, 83.
Vol. V.—No.'s 91, 93, 95 and 96.

Those of our subscribers who do not bind the Journal, would do us an especial favor by forwarding to us any of the above numbers. We are being constantly called upon to furnish back issues of our paper by those who value it for future reference, and we have supplied them until all of the above numbers are exhausted.

REVOLUTION IN A PRINTING OFFICE.—On the 7th Sept. the entire force of the compositors on the Chicago Times was dismissed and forty young women were instituted. The proprietors of the Times had been preparing for this course several months, ever since the strike, and had these girls under instruction in private rooms about the city. This movement has caused great sensation among the printers, as it was understood that the Times had resolved to break up the printers' association. This association took advantage of the proprietors of the Times and sought to control or destroy their business. In turn the publishers have thus attacked the association.

GAS FOOT-WARMERS.—Many persons are greatly annoyed by cold feet; and although gas-stoves for heating apartments and cooking purposes are coming greatly into use, we find nothing introduced for foot-warming. Will not some enterprising manufacturer get up an article specially adapted for the feet. A nice little article made of porcelain, not much larger than a spittoon, would sell in this market very readily. By keeping the feet warm both health and comfort are greatly promoted. *Scientific American.*

ALPHABETS.—The number of letters in the alphabets of different languages is as follows: English, 26; French, 25; German, 26; Spanish, 24; Dutch, 26; Greek, 24; Latin, 25; Slavonic, 27; Arabic, 28; Persian, 31; Turkish, 33; Georgian, 36; Hebrew, Chaldee, Syriac and Samaritan, each 22; Coptic, 32; Sanscrit, 50; Bengalese, 21; Burmese, 19.

At Plymouth, England, the price of illuminating gas is three shillings (73 cents) per 1,000 feet.

THE WATER-METER.

We are at a loss to understand why the Croton Aqueduct Department of our city does not employ the Water-Meter, to put an immediate stop to the wicked and useless waste of water that is rampant everywhere. It is the duty, not only of those controlling the water supply of this city, but of the water boards of other cities, where the dangers of fire are increased by the large and wasteful use of water at the approaching inclement season. The excuse that there are no reliable water-meters adapted to the various peculiar pressures of water works cannot now be urged, for we find that their use in Philadelphia have given them a thorough test, and that they have been found reliable and satisfactory. It is not necessary that a meter should register by the drop test in our present abundant supply of water; a meter reliable for all ordinary purposes, furnishing an approximate registry of the consumption, will be satisfactory to all as a great improvement over the present unlimited and surprising license granted, as it were, by common consent, to reckless and improvident communities. We call upon the custodians of this vital treasure, to take the matter in hand, and have a number of meters manufactured and applied to the works of every consumer—so that those who waste may pay for their improvidence.

SOLUBILITY OF PARAFFINE.—Aug. Vogel has determined the solubility of paraffine in benzol, chloroform, and sulphide of carbon The paraffine experimented with melted at 48° C., and congealed at 45°. The benzol had the specific gravity 0·887. One part of benzol at 46° C. dissolved 7·7 parts paraffin.

43°	"	5·0	"
39°	"	4·0	"
23°	"	0·7	"
20°	"	0·3	"

SOLUBILITY IN CHLOROFORM.—One part of chloroform at 23° dissolved 0·22 parts paraffine. One part of chloroform at 20° dissolved 0·16 parts paraffine.

SOLUBILITY IN SULPHIDE OF CARBON.—One part of sulphide of carbon at 23° dissolved an equal weight of paraffin.

Comparative experiments with stearic acid showed that one part of benzol at 23° C. dissolved 0·22 parts of stearic acid; and one part of sulphide of carbon at 23° dissolved 0·3 of stearic acid. This acid is consequently less soluble in the above menstrua than paraffin. A mixture of stearic acid and paraffine fused together did not separate from these solutions in a homogeneous mass, but in two layers, the stearic acid appearing in distinct crystals. This may suggest a method of recognising the presence of stearic acid in a mixture with paraffin

OIL EXCITEMENT IN ERIE CITY.—The Althoff well is being pumped with good results—nothing less than six barrels per hour. The excitement among the adjacent property holders may be better imagined than described. It is a success which has been well earned by the company, and we are glad they are getting their reward. Here is a new source of wealth to our city. Our flats will probably soon be overspread by a city of derricks. The striking of a few more such yields as this would make the yield of our State fully up to the usual amount and seriously interfere with the plans of those who now keep up the price of petroleum.

On Reese River there are twenty-five hot springs, from milk warm to boiling hot, and they measure from ten to one hundred feet in diameter, and from one hundred to one hundred and eighty feet in depth.

It is a beautiful saying of somebody that gratitude is the music of the heart when its chords are swept by the gentle breeze of kindness.

PROPERTIES OF BENZINE.

One of the first products which comes over, in company with a large amount of water, is a mixture of volatile hydrocarbons, which has received the name of crude naphtha, and when further distilled, is known as rectified coal naphtha; this is further purified by mixing it with ten per cent. of concentrated sulphuric acid, agitating and setting aside for some hours to rest; when the mixture is cold, five per cent. of peroxide of manganese is added, and the upper portion submitted to distillation. This mode of purification has been recomended by the late Prof. Gregory of Edinburg. The specific gravity of the rectified naphtha is 0·850; it is used extensively as a solvent of caoutchouc, and other allied gums, and also of resins for the preparation of varnish. By repeated purification and fractional distillation, what is termed benzole or benzine, by Pelouze and others, is obtained; naphtha being a heterogeneous liquid, made up of several hydrocarbons, of which benzine is the most abundant and important.

The numerous applications of which this liquid is susceptible, renders it one of the most valuable substitutes for alcohol, ether, turpentine, and other fluids in common use, as a menstruum for dissolving gums, resins, and other commercial products. Its property of dissolving fat, renders it useful for cleaning cloth, leather, &c., from spots of grease, wax, tar, or resin, without any resulting injury to the color, or permanent odor of the fabric.

Mr. Grace Calvert has pointed out the application of this property in the manufacture of carpets; it had been necessary to oil "slubbing wool" before being spun, and necessary to remove the oil subsequently, so that the color might be more bright; but this removal was very difficult, and the brilliance of the colors was injured by the presence of the oil, and the carpet soon became faded; but by the use of benzole this oil can be readily removed, and thus the fabric is capable of receiving a brilliant dye.

When treated with strong nitric acid, benzine produces "nitro-benzole," a substance which is now much used as a substitute for Oil of Bitter Almonds, in perfumery: it is not acted on by ordinary sulphuric acid, but with the anhydrous acid it forms a conjugated acid.

Benzole boils at 186°; density of the vapor=2·38. At 32° it crystallizes to a gelatinous mass, which melts at 44·6°; it is insoluble in water, but very soluble in alcohol and ether. On account of its rapid evaporation, Mansfield applied it for the purpose of impregnating gases by passing them through a layer of it: or by suspending cloths soaked with it in an atmosphere renewed by a fan or blast. The air, when saturated, burns on account of the quantity of vapor present. The evaporation of the benzole, in this process, produces so much cold as, after a time, to check further evaporation; and hence, this method of producing gas is beset with practical difficulties not yet fully overcome.

The formula representing the composition of benzine is C12 H6; the substance yields an analysis, in 100 parts, carbon 86, and hydrogen 14. As it contains no oxygen, and, when pure, does not absorb oxygen from the air, it is used to preserve the oxidizable metals, as potassium, &c., from contact with the atmosphere. It yields, when burned, nothing but carbonic acid and water: when sufficient air is not supplied, carburetted hydrogen is produced, and carbon deposited unconsumed.

A BEAUTIFUL THOUGHT.—A writer whose life has passed its meridian, thus discourses upon the flight of time:

"Forty years once seemed a long and weary pilgrimage to make. It now seems but a step. And yet along the way are broken shrines, where a thousand hopes have wasted to ashes; foot-prints sacred under their drifting dust, green mounds where the grass is fresh with the watering of tears; shadows even which we would not forget. We will garner the sunshine of those years, and with chastened step and hopes, push on toward the eve.

THE CLOSING OF LIFE.—Of all periods and events of life, the concluding scene is one of the deepest interest to the person himself and surviving spectators. Various are the ways in which it comes, and various the aspects it presents; but it is solemn in all. What can be more so than the approach of that moment which, to the dying man, is the boundary between time and eternity; which concludes the one and commences the other; which terminates all his interests in this world, and fixes his condition for a never-ending existence in a world unknown? What can be more solemn than those moments of indiscribable anxiety, when the last sands of the numbered hour are running out; when the beating of the heart has become too languid to be felt at the extremities of the frame; when the hand returns not the gentle pressure; when the limbs lie stiff and motionless; when the eye is fixed, and the ear turns no more toward the voice of consoling kindness; when the breath, oppressive and laborious before, becomes feebler and feebler till it dies slowly away, and to the listening ear there is no sound amid the breathless silence, nor to the arrested eye that watches with an unmoving look of thrilling solicitude for the last symptom of remaining life, is motion longer perceptible; when surrounding friends continue to speak in whispers and to step through the chamber on the tiptoe of cautiousness, as if still fearful of disturbing him whom the noise of a thousand thunders could not startle, and who has fallen into the last sleep from which nothing shall ever rouse him but the "voice of the archangel and the trump of God?"

OCEAN WAVES.—Great exaggeration has prevailed in respect to the altitude of ocean waves. Even learned writers, until very recently, continued to speak of their rising 40 to 50 feet high. In November, 1840, I encountered, during a voyage from New York to Barbadoes, in a small bark, one of the severest hurricanes of the present century. It was one of those great cycloidal storms, reported on by the late Col. Reid, swept down the whole length of the Carribean Sea, and turning with the Gulf Stream, followed the coast of North America to Newfoundland, and finally crossed the Atlantic to the shores of England. Owing to the ignorance and stupidity of the captain, we received the whole force of the storm for four days, almost under bare poles, when, by changing the course of his vessel, he might have run out of it in a few hours, as I endeavored in vain to convince him. When we reached the middle of the Gulf Stream, where the current was three knots an hour, off the Capes of Carolina, we had the wind at its greatest force from the north, almost in an opposite direction to the current, raising the waves to what people delight to call, in poetic language, "mountains high." Being a good sailor, I mounted the mast to get a better view of the terrible desolation which surrounded our little bark, and to measure the height of the waves. I was quite surprised, when I had mounted about 30 feet, to find that I was on a level with the crest of the waves when the ship was at the bottom of the "trough." I therefore arrived at the conclusion that they never rise above 16 or 18 feet above the ocean's level when at rest. The violence of the waves was such (as we found when we came in port) that nearly one-third of the copper was torn from the ship's sides and bottom.

AMYGDALOID MINE.—The product of this mine for the month of August was twenty tons of copper, twenty-one stamps in operation. A mass of eight hundred pounds were found in the north drift, second level.

The swan subdues the eagle when he attacks her on her own element: so the weakest may subdue the strongest foe, if he but keep his place and do his duty.

PETROLEUM REVIEW—SEPTEMBER 15TH.

NEW YORK, Oct. 3d, 1864.

CRUDE. The market has been dull since my last, and holders have had to submit to a steady decline—and it has fallen on the average 14 cts. per gall Sales at the close are limited—Crude being freely offered at 38 cts. On Saturday sales were made of 500 blls 40° C 47° gravity at 37½ cts. and 300 blls. 40° a 45° gravity at 38 cts. The export demand has fallen off considerably.

REFINED. In bond has also declined in price, and is now selling at 64 cts—a decline of about 20 cts. per gall. I notice sales of 500 blls. at 64 cts. prime light straw to white, 1,500 blls. light straw to white at 62½ cts. and 428 blls light straw at 61 cts.

Free oil is equally dull and is selling from 72 to 74 cts.

BENZOLE. is dull at about 45 cts. for prime 60° a 63° gravity.

REMARKS. The market has declined with gold, and will probably continue to fluctuate with it.

B. L. HARSELL.

Commission Merchant,

132 and 134 Maiden Lane, N. Y.

AN ELECTRIC TELEGRAPH WITHOUT WIRES.—Experiments are now in progress, both at Mont Valerien and Vincennes, says Galignani, for the purpose of testing a new system of electric telegraphy invented by M. Armant Douat, who, it is said, has found means to do away with electric wires altogether, and transmit despatches by the sole action of the earth. A zinc and a copper plate, bent in spindle-like shape, are buried in the ground, with their convexity turned in the direction in which the despatch is to be sent. If there be anything in this, it certainly excels the Dundee electro-telegrapher (now deceased,) who sent messages across Portsmouth harbor without any crossing wire, but by means of wires and plates on either side, extending at right angles to the line of direction across the harbor.—This gentleman, (Mr. Lindsay, if we mistake not,) was confident that merely by means of plates, with wires extending for many miles on either side, a Transatlantic telegraph might be made.

SHINGLES RENDERED FIRE-PROOF.—Mr. John Mears says, in the Boston Cultivator, that he has prepared shingles in the following manner, and after an experience of eleven years, and using seven forges in his blacksmith's shop, he has never seen a shingle on fire nor has a nail started. The shingles are prepared in the following manner: "Having a large trough, I put into it a bushel of quick-lime, half a bushel of refuse salt, and five or six pounds of potash, adding water to slack the lime and dissolve the vegetable alkali and the salt—well knowing that pieces of an old lime pit, a soap barrel, or a pork tub, were not the best kindling stuff, and having long since learned while at the Vineyard Sound, that hot salt water white wash endures far longer than that made with fresh water, absorbing moisture, striking into the wood and not peeling and washing off I set the bundles of the shingles nearly to the bands, in the wash for two hours; then turned them end for end. When laid on the roof and walls, they were brushed over twice with the liquid, and were brushed over at intervals of two or three years after."

NEW YORK MINING EXCHANGE.

NEW YORK, Oct. 3d, 1864.

	Bid.	Asked		Bid.	Asked
Copper Stocks.			***Gold Stocks.***		
Aztec	7⅜	9	Benton	1	1¼
Bedford	1	1⅛	Consol'd Gregory	25	28¾
Boston	4⅛	5¼	Corydon	—	3
Caledonia, A. P.	10	12	Gunnel	3¾	4¼
Canada	3¾	4	Great Western	—	8
Carp Lake	3	5	Hope	—	9
Central	65	70	Isaac's Harbor	⅝	¾
Columbian	—	24	Manhattan	—	9
Copper Falls	34⅛	38	Mariposa	44	44¾
Clifton	—	41	Montana	⅝	1
Dacotah	—	5¾	New York	2⅜	3
Derby	⅞	1⅜	N. Y. & Nova Scotia	⅝	1¼
Douglass	—	—	Quartz Hill	9¾	10
Evergreen	18¾	20	Quicksilver M'g Co	81	82
Flint Steel River	12	13⅛	Rocky Mountain	—	10¾
Frue	2¾	5	Smith & Parmelee	7	12
Grand Portage	—	—			
Hancock	12⅜	14	***Coal Stocks.***		
Hamilton	—	6	American	98	100
Hilton	5	6	Ashburton	—	25
Hudson	1	2	Central	62	65
Huron	32	33	Cumberland	61	62
Indiana	8¾	9¾	Del & Hud. Canal	206	208
Isle Royale	20	20⅜	*Hampshire & Balt.	104	110
Keweenaw	—	6	Pennsylvania	213	215
Knowlton	7	10			
Lafayette	1	2	***Lead Stocks.***		
Manhattan	—	—	Bucks County	⅝	¾
Mendota	—	—	Clute	1⅜	1¾
Merrimac	4¾	5⅛	Erie	—	20
Minnesota	33	37	Macomb	3⅛	5
New York, A. P.	2	3⅛	Plancentia Bay	1¼	1⅜
N. J. Consolidated	4	4⅜	Sussex	⅜	¾
Norwich	—	6	Wallkill	3⅛	6
Ogima	5	6¾			
Ontonagon	3	4	***Iron Stocks.***		
Penn	—	11⅜	Copake	8	10
Providence	1⅜	2	French Creek	⅞	1
Quincy	96⅜	98	Teal Lake	4⅜	6
Reliance	1⅛	2¾			
Rockland	12⅛	14	***Miscellaneous.***		
Superior	8⅜	9	Rutland Marble	17	20
Sharon Consolidated	—	3			

* *Ex. div.*

TO ADVERTISERS.—Our paper offers a superior medium as an advertising agent, to all those who manufacture or sell machinery or appliances of any kind for Gas, Mining, Water, Sewerage, the production or purification of Oils, &c. &c., not so much on account of a wide-spread circulation, as from the fact that it goes directly to the hands of those who are constantly using and requiring machines and improvements for these branches, and who look through our columns for information where to procure them. The class of people who read our paper not only peruse our pages of reading matter, but read the advertisements as well, for the reason that they are directly interested in all things pertaining to their business. We therefore ask, with confidence that we can do them justice, all parties having machinery or improvements of any kind for either of the objects to which our paper is devoted, to send in their advertisements and avail themselves of these advantages. It will be observed that our terms for advertisers are very reasonable.

THE HUMAN EYE.—The language of the eye is very hard to counterfeit. You can read in the eye of your companion, while you talk, whether your argument hits him, though his tongue will not confess it. There is a look by which a man shows that he is going to say a good thing, and a look when he has said it. Vain and forgotten are all the fine offices of hospitality, if there be no holiday in the eye. How many furtive invitations are avowed by the eye though dissembled by the lips. A man comes away from a company; he has heard no important remark, but if in sympathy with society, he is cognizant of such a stream of life as has been flowing to him through the human eye. There are eyes which give no more admission into them than blue berries; others are liquid and deep wells that men might fall into; and others are oppressive and devouring, and take too much notice. There are asking eyes, and asserting eyes, and prowling eyes, and eyes full of faith—some of good and some of sinister omen.

ROBBINS' PATENT GAS AND WATER JOINT.

THE PROPRIETORS of this unrivalled joint are now prepared to introduce it to general use, and to guarantee that, in all respects, it will fulfil perfectly all the requirements of either water, gas, or steam. It is a joint which remains in all situations absolutely tight.

The following illustrations, with the appended explanations, will give a good idea of the improvement:

Fig. 3.

Fig. 1.

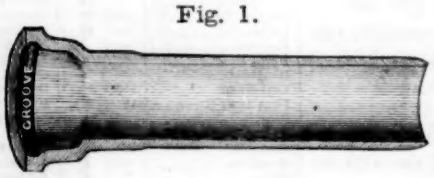


Fig. 2.

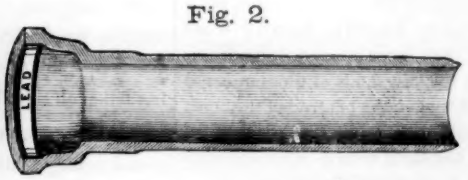


Fig. 4.

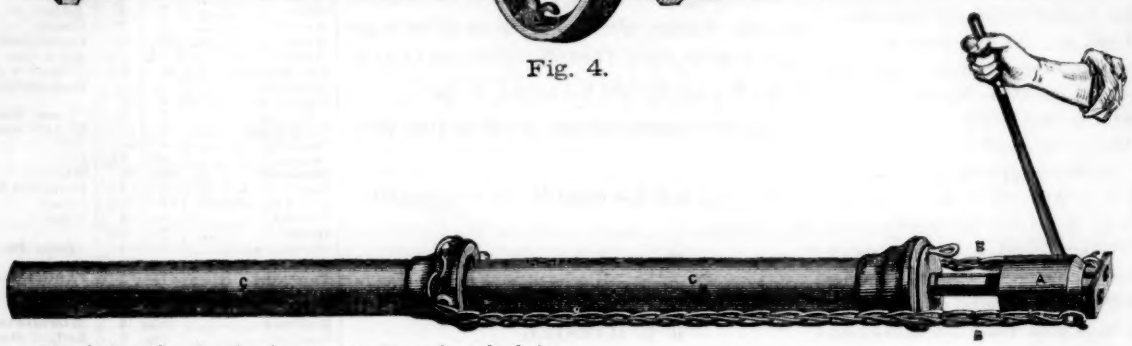


FIG. 1. Is a sectional view of a pipe showing a groove to receive a lead ring.

FIG. 2. Is a sectional view of a pipe showing a lead ring in the groove.

FIG. 3. Represents a former, which is used in the bell end of the pipe while casting the lead ring. Before using the former, however, a strip or belt of India rubber is first inserted in the socket, against which the former rests to prevent the lead escaping from the groove while being cast. Upon the cooling of the lead, the former and rubber ring are withdrawn from the socket, and the lead ring is left projecting inwards from the groove all around, forming an indestructible packing to receive the spigot-end of the pipe.

FIG. 4. Shows two pieces of pipe in connection with an hydraulic jack, by which the spigot-end of the pipe (which is cast tapering and may be cast in a chill), is forced into the lead ring in the groove which perfects the joint. A, represents the jack; B, B, the chains by which the pipes are drawn together; and C, C, pieces of pipe.

This ring joint packing may be cast at the foundry or any convenient place, and when delivered at the ditch, may be laid, and perfect joints formed, by any laborer, above or below the surface, or in ditches filled with water, there being *no joint ditching required*, and it can be laid with very great rapidity.

Among the economies realized by this joint may be enumerated, the saving in the weight of the pipe, in the amount of lead required to be used in forming the packing, in the labor of ditching, and in laying the pipe.

The bell or socket may be cast one-half the usual length, as the width of the groove requires, but from a half to one and a half inches, according to the size of the pipe, thus saving in the total weight about two hundred pounds per ton.

The weight of lead required to form this joint, as compared with the amount of lead used in forming a joint according to the old method, is fully seventy-five per cent. less, only so much being required as to maintain the compensating principle, or enough to allow (upon the raising or depressing of the line of pipe out of a direct line) what is lost upon one side of the ring packing, to take its place upon the other; thus securing flexibility of the joint without affecting its reliability. The use of yarn or hemp packing is dispensed with, the cost of which is an entire saving as compared with the old method of making joints.

The saving of labor in ditching is the total amount usually expended in digging joint-holes, there being *no joints to be caulked.*

The saving in labor in laying pipe furnished with this joint is a sum equal to the whole cost of carrying lead, fuel, ladles to the ditches, casting the lead, bailing out water, and the entire labor of caulking, less only the sum charged for casting the lead ring packing at the foundry, which is comparatively trifling. This last-mentioned economy has been estimated by the best engineers at seventy-five per cent., or the same as the saving in the quantity of lead used.

The cost of pipe cast from our patterns is the same per ton as pipe cast for the old form of joint. The principal iron-founders propose to charge the same price.

We have submitted these joints in water-pipes to a pressure of two hundred and fifty pounds to the square inch, and they have remained perfectly tight. It has also been submitted for months in gas-pipes to the ordinary pressure of our city gas-mains, without any leakage whatever. We are aware that these statements may be deemed by many extravagant, but the merits of the improvement warrant them all, and the most skeptical may be fully convinced by an investigation of its value, and by witnessing the tests to which we submit it, or by its use under any conceivable circumstances.

TESTIMONIALS.

OFFICE OF THE WATER COMMISSIONERS,
CITY HALL, JERSEY CITY, October 14th, 1863.

Dear Sir,—On the 26th of May last, about two hundred and sixty feet of cast-iron water-pipes, six inches in diameter, with joints constructed according to your invention, were laid for the Jersey City Water-Works, in Prospect street.

The operation of uniting the joints of the pipes, was performed with remarkable facility, and with an important saving in time, materials, and labor. The joints proved perfectly water-tight, after turning the full head of water on the pipes.

In my opinion, your invention has proved entirely successful, and will be found highly beneficial to water companies.

Yours, respectfully,
ROBT. C. BACOT,
Superintendent and Engineer, Jersey City Water-Works.

MR. R. C. ROBBINS.

ENGINEER'S OFFICE, CROTON AQUEDUCT DEPARTMENT.

Dear Sir,—I have examined your plan for making joints in cast-iron water pipes, and have a report from one of my assistants, of certain experiments made by you, to prove the certainty and economy with which the joints can be made, and their stability when finished.

I think the experiments showed that the joints could be made quite as rapidly, if not more rapidly, than those made in the ordinary method now in use; the quantity of lead used was less than that required in the common joint, and no yarn packing was required. In these respects, your joint seems superior.

After the joints were made, a pressure of three hundred pounds to the square inch, was put upon he pipe in such a manner as to test the efficiency of the joint to prevent both leakage of water, and separation of the pipes from each other longitudinally. This pressure failed to produce either leakage at the joint, or separation, so long as the pipes lay in a direct line; but on deflecting them six and a half inches, in a length of twelve feet, the joint commenced leaking. It is fair to add, that this is a greater deflection than would often be found necessary in laying pipe.

I think the efficiency of the joint in both the points tested in this last experiment, might be increased by increasing the quantity of lead, both in thickness and width.

Altogether, the result of the experiments was such that I have determined to make a more thorough test of your invention by putting down about one thousand feet of pipe, when we commence our operations for the coming season.

The diameter of the pipe subjected to experiment, was six inches, and is the same size that I propose to put down next year.

I am, very respectfully, your obedient servant,
A. W. CRAVEN, Chief Engineer, &c.

To R. C. ROBBINS, Esq., Jersey City.

METROPOLITAN GAS-WORKS,
ENGINEER'S OFFICE, NEW YORK, October 9th, 1863.

Dear Sir,—The undersigned had the pleasure of being present at an experimental test of your patent joint for gas and water pipe, made at the yard of the Croton Aqueduct Department, and cheerfully testify to the results obtained, namely:

First experiment was made with two lengths of eight-inch pipe, jointed together, when a pressure of three hundred pounds to the square inch was applied. This pressure did not force the pipe apart, nor start the joints, but they remained, during this experiment, perfectly tight.

Second experiment was made by deflecting the pipe five inches, which is about equal to eighteen inches in one hundred feet, and the same pressure applied, which caused a small leak at the joints.

Third experiment was made by taking the pipes apart and rejointing them, when the same pressure was applied when lying straight and when deflected; at this experiment there was no leakage.

From these severe tests it is my impression that the superiority of your patent joint has been made manifest, and that it must eventually supersede the old way of jointing pipes together, saving both time and material.

Wishing you success in your enterprise,

I am, very respectfully, yours, &c.,
AMBROSE J. WHITE, Engineer.

To R. C. ROBBINS, Esq.

OFFICE OF THE METROPOLITAN GAS-LIGHT COMPANY,
NEW YORK, October 9th, 1863.

Dear Sir,—Having been present at the testing of your patent joint for gas and water pipe, at the yard of the Croton Aqueduct Department, I can testify to the results as stated by Col. A. J. White and fully concur with him in the opinion expressed in his letter to you of this date.

Very respectfully, yours,
W. TITUS, Secretary.

R. C. ROBBINS, Esq.

NEW YORK, October 23d, 1863.

Gentlemen,—I am pleased to be able to inform you, that we are fully satisfied that we have done well in adopting your "Improved Joint," in the construction of an aqueduct which we are now building on Oil Creek, Northwestern Pennsylvania.

We have ten miles of three and four inch pipe to lay this season, and, in our estimation, the perfection of the joint, economy in lead, and rapidity with which the pipe can be laid, render it entirely preferable to any other method of laying pipe.

Our Mr. Hutchings advises us that he is putting down the three and four inch pipe at the rate of twenty-five to thirty lengths per hour, with two men in the trench. We are much pleased with this result.

Respectfully yours,
HUTCHINGS & FOSTER.

Messrs. R. C. ROBBINS & Co.

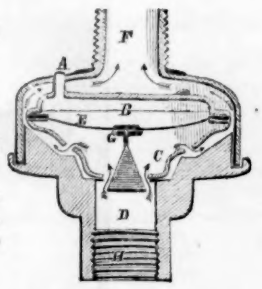
For further information, or for prices and terms, which will be very reasonable, apply to

R. C. ROBBINS & CO.,
No. 218 FULTON STREET NEW YORK

NOTICE TO GAS COMPANIES AND GAS CONSUMERS.

THOMPSON'S PATENT GAS CONTROLLER,

The only Self-Acting Gas Controller, Regulator, and Burner Combined which has ever been invented, or known to sci nce.



THE PRINCIPLE UPON WHICH THE THOMPSON'S AUTOMATIC GAS CONTROLLER works is one well known to mechanics, and is simple in its operation.

Within the circumference of a small cylinder below the burner is placed a conical valve attached to a movable diaphragm. The diaphragm rises or falls as the pressure of gas from the pipe is lesser or greater, and the valve acts upon the valve-seat with such regularity of movement that in a difference of from five-tenths of an inch pressure to five inches the variation in flame is hardly perceptible.

The simplicity of its machinery and the nature of the material used in its construction insure its regular action and durability.

In consequence of the uniform quantity of gas which passes the Controller to the burner, there is no waste, and a steady, soft flame is produced, which is important to all who read, write, or work by gas light. The unsteady flickering blaze which invariably exists when the pressure of gas is beyond the requisition for consumption, has injured the sight of thousands who have been subjected to it.

For street lamps these Controllers are especially valuable, because the pressure varies materially during the night, and in consequence there is a waste of gas, and the light variable.

Improvements have lately been made in the mechanism of the Controller which makes them almost a perfect meter to each burner, and they are now offered to the public with more confidence than ever before.

Reference is permitted to the following named gentlemen—

Col. CHAS. ROOME, President Manhattan Gas Company, N. Y.
C. H. SANDS, Esq., President Metropolitan Gas Company, "
J. H. ADAM, Esq., President New York Gas Company, "
PETER COOPER, Esq., Cooper Institute, "
JOHN A. DUFF, Esq., Olympic Theatre, "
GEO. H. KITCHEN, Inspector of Gas Meters, N. Y.
A. L. BOGART, Esq., Gas Engineer.
Col. J. A. SABATTON, Engineer Manhattan Gas Company.
Col. A. J. WHITE, Engineer Metropolitan Gas Company.
J. K. SIMPSON, Esq., Engineer Cooper Institute.

Persons interested are invited to call at the manufactory, 52 Greene street, where they can see the operation by pressure guage and test meters.

M. L. CALLENDAR, Agent,
Office, 52 GREENE STREET.

THE AMERICAN METER CO.,

Organized under the General Manufacturing Laws of the State of New York.

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER.

TRUSTEES.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

512 WEST TWENTY-SECOND STREET, NEW YORK,
ARCH AND TWENTY-SECOND STREETS, PHILADELPHIA,
1 BARRETT STREET, BOSTON, will meet with prompt attention.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam-stops.

HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

J. D. WEST & CO.,
179 BROADWAY, N. Y.

GEO. H. KITCHEN & CO.,
NEW PATENT
GAS APPARATUS
For Country Residences, Public Buildings, &c.,
FROM $300 UPWARDS.
EVERY DESCRIPTION OF GAS FIXTURES.
Gas Fitting in all its branches.
561 Broadway,
NEW YORK.

NEW YORK FIRE-BRICK and Clay Retort Works. (Branch Works at Kreischerville, Staten Island.)

B. KREISCHER, office 56 Goerck street, corner Delancy street, New York.

GAS RETORTS, TILES and FIRE-BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND. Articles of every description made to order at the shortest notice. B. KREISCHER.

PHILADELPHIA FIRE-BRICK Works, corner of Vine and Twenty third streets, Philadelphia.

JOHN NEWKUMET,

Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

GLYCERIN
FOR
Filling Wet Gas-Meters,
Cheaper than Whisky or any other substance.

We have furnished the Cincinnati Gas and Coke Company 300 barrels Glycerin, for filling their wet meters, and are now ready to supply other Gas Companies at the lowest cash prices.

We warrant our Glycerin not to corrode the meter metal, nor to freeze at the lowest ordinary temperature, nor to evaporate.

HARTMAN & LAIST,
Manufacturing Chemists,
Cincinnati, O.
Office 64 Sycamore.

To Gas Companies.

A YOUNG MAN, FROM ENGLAND, thoroughly educated, and who has had nine years experience in the Newcastle-under-Lyne Gas-Works, England, as an assistant Manager, desires a similar situation in some Gas-Works in the United States. He has credentials of capacity for such a position.

Address, M. C. P. LAWTON,
Office GAS-LIGHT JOURNAL.

WOODEN PURIFYING TRAYS.

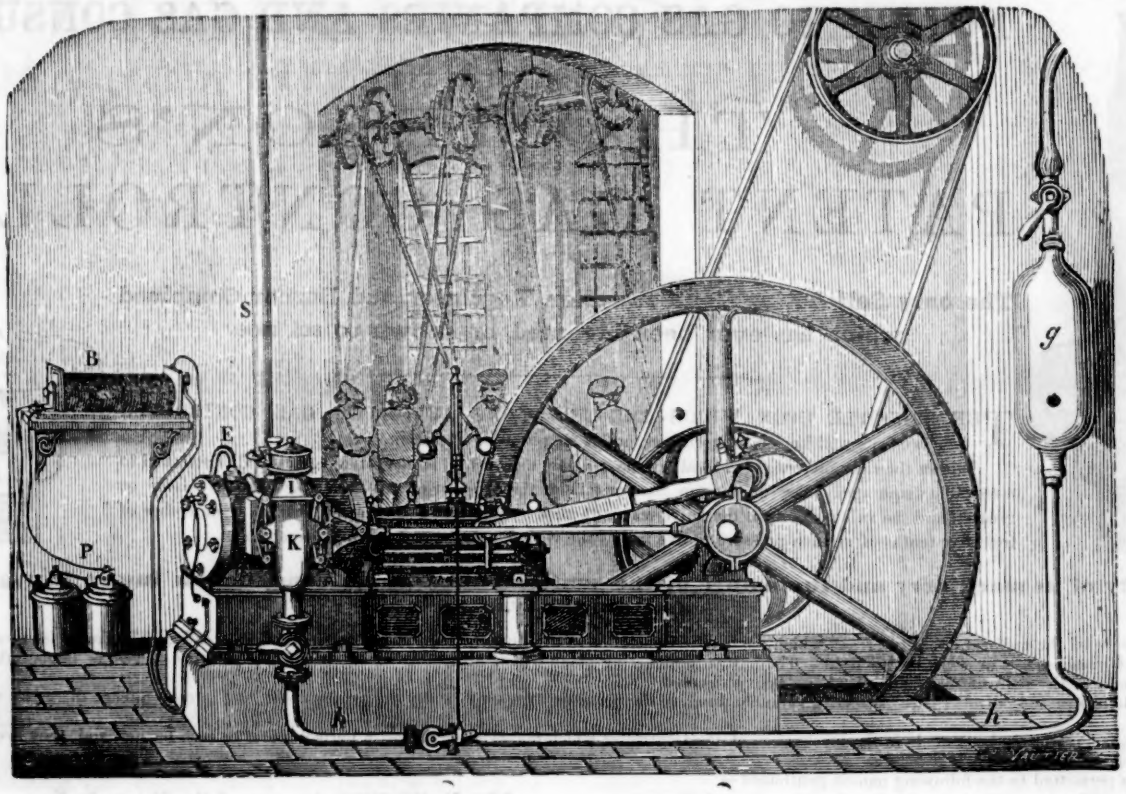
PATENT
Conically Slotted Solid Wood Sieves
FOR GAS PURIFIERS.
CAUTION
TO
GAS MANUFACTURERS.

The Conically Slotted Solid Wood Tray was patented 21st October, 1862, by N. O. Hawxhurst, assignee of Wm. Combe, and all persons are cautioned against purchasing such trays of R. G. Hunt, or any other person except the subscriber, as it is a direct infringment of said patent. The following companies are now using these trays.

Manhattan, New York,
Williamsburgh,
Brooklyn,
Albany,
Baltimore,
Philadelphia,
Chicago.
Louisville,
And numerous others.

Orders received by mail or otherwise.

JOHN L. CHEESMAN,
147 Ave. C, New York City.



MOTEUR—LENOIR.

LENOIR GAS ENGINE.

This is a horizontal engine, in which a piston, by a connecting rod drives a horizontal shaft.

The gas enters by the pipe "h" from the regulating reservoir "g," (made of vulcanized india rubber,) which regulates the feeding and the branches connected with the gas-pipe.

The tube, K, receives the gas conveyed by the pipe "h," and conducts it to the valve, which opens and closes alternately, by means of a rod moved by an eccentric wheel fastened to the end ot the shaft.

Two of Bunsen's piles, P, sufficient to produce the electricity are placed at a little distance from, and in communication with a Ruhmkorff electric apparatus, B. The electric current of this apparatus is conducted by means of insulated wires to the electricity distributor "m," placed on the front of the frame, while the current of electricity and its arrival at the inflammator, inserted at each end of the cylinder, is directed by the movement of the piston-rod, which, by an ingenious combination, impels a small movable slide before the distributor.

The burnt gas, after having performed its functions in the machine, escapes, by means of a valve, through a pipe, S, and the water designed to cool the interior of the cylinder enters through a double passage, by means of a pipe situated near the escape-valve, and goes out by the pipe, E.

A two horse and a half horse Engine are now in practical operation at the brass cock manufactory of Mr. A. Carr, *No.* 135 *Mercer St, between Prince and Houston Streets,* New York where those interested are invited to call and examine them.

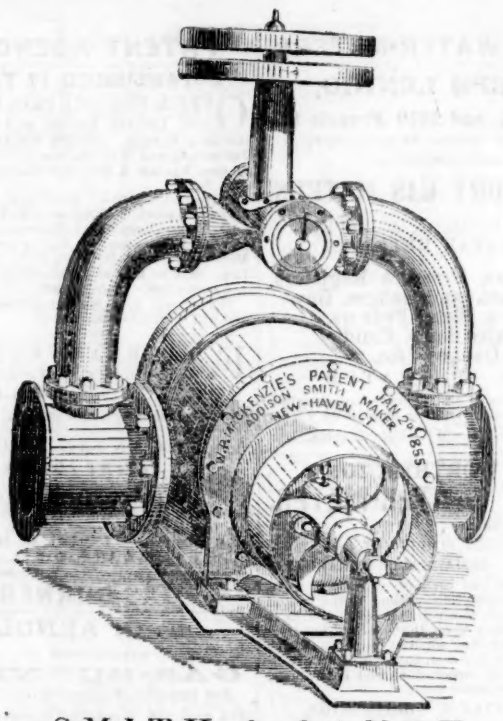
THE LENOIR GAS ENGINE

Requires no Fire and makes no Smoke,

No Noise, no Dirt, and is thoroughly safe.

It is propelled by the expansion of Air, dilated by the combustion of Gas within the cylinder, ignited by the

ELECTRIC SPARK.



SMITH & SAYRE,

Sole Proprietors and Manufacturers of

THE MACKENZIE PATENT GAS EXHAUSTER

AND

PATENT COMPENSATOR.

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. fuel. Address SMITH & SAYRE, 458 Broadway, New York.

HARRIS & BROTHER,

PRACTICAL GAS METER MANUFACTURERS,

Continue, as heretofore, at their old Establishment,

No. 1117 CHERRY ST., PHILADELPHIA,

TO MANUFACTURE

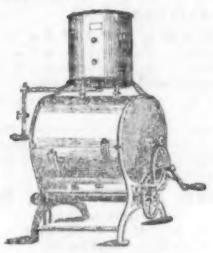
WET AND DRY GAS METERS (Consumers'),
STATION, EXPERIMENTAL AND SHOW METERS,
GLAZED METERS, METER PROVERS, AND PHOTOMETERS,
GOVERNOR AND CENTRE SEAL DRUMS,
FLUID AND PRESSURE GUAGES,
PRESSURE REGISTERS AND INDICATORS, &c., &c., &c.

All our work warranted. All orders addressed to
HARRIS & BRO., 1117 Cherry Street, Philadelphia.

DRAKE'S

PATENT

AUTOMATIC GAS MACHINE.



THIS MACHINE, which has been in constant use for more than two years, is now acknowledged to be the

Most Convenient,
Simple, and
Efficient Method

OF LIGHTING BUILDINGS OF ALL KINDS, out of the reach of regular gas-works, ever brought to public notice.

The SIMPLICITY OF THE APPARATUS, its ENTIRE FREEDOM FROM DANGER, the LITTLE ATTENTION REQUIRED, the EASE WITH WHICH IT IS MANAGED, and THE CHEAPNESS and SUPERIORITY OF THE LIGHT, has gained for it the favorable opinion of those acquainted with its merits.

The Machine takes up but little room; no disagreeable odor is experienced in its use; no fire is applied to the apparatus at all; it can be attached to ordinary gas-pipes used for coal-gas, and is burned through the same kind of fixtures.

These Machines are manufactured in Boston, by the AUTOMATIC GAS-MACHINE CO., and are for sale at their Store, 78 Washington street, Boston, and also at the Agency, MITCHELL, VANCE & CO.'s, No. 620 Broadway, New York

For further particulars, address—

MITCHELL, VANCE & CO.,

620 BROADWAY, NEW YORK CITY.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Four Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agents—S. R. WILLIAMS, 204 South Front st., Philadelphia.
CALVIN GAY, 29 Doane st., Boston.

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STANDARD

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OF COLORADO.

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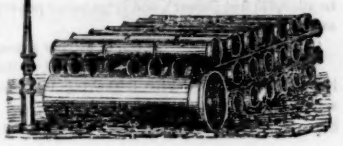

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Sold by wholesale Grocers and Druggists.

Glycerin for Gas Meters.

This article is superior to any fluid ever before used for Wet Meters, and we cannot better set forth its advantages than by giving the following letter from the Superintendent of the Covington Gas Co. The superiority of our Glycerin over all others in the market, for this purpose, is admitted by every Company that has used it. We have sold, the past winter, to the Cincinnati Gas-Light and Coke Co.; to the Gas Companies of Covington, Ky.; Dayton, Springfield, Portsmouth, Urbana, and Piqua, Ohio Richmond, Ind., and Buffalo, N. Y, to whom we refer.

Glycerin is much cheaper than Whisky is now, or likely to be hereafter, and not evaporating, greatly increases the economy of its use.

OFFICK OF THE COVINGTON GAS-LIGHT CO,
COVINGTON, KY., Feb. 18, 1864.

MESSRS. W. J. M. GORDON & CO.:

Dear Sirs,—It affords us great pleasure in testifying to the superiority of the Glycerin Fluid purchased from you for filling the Wet Meters now in use by the Covington Gas-Light Company.

The difficulty of finding a non-evaporating and anti-freezing mixture for Wet Meters, has, in my opinion, been overcome by the use of your Glycerin Fluid.

I have had it in constant use for the past four months, and during that period the thermometer has ranged as low as 14° below zero, and after careful examination, I have found the fluid in the same condition as when first put in the Meters, and without the slightest discoloration.

Its non-evaporating quality does away with the hitherto unavoidable expense of filling the Meters monthly, and renders Wet Meters no longer objectionable.

In fact, I can cheerfully recommend it as being cheaper and better than any other Fluid or Mixture now in use.

Very respectfully,
S. S. STRATTON, *Sup't Cov. Gas Co.*

We have been engaged in Manufacturing Glycerin the past six years, and from our advantage in material and the large amount we make, are enabled to offer it lower than any manufacturer in this country. We will be pleased to quote prices or to give further information.

W. J. M. GORDON & BRO.,
MANUFACTURING
CHEMISTS & DRUGGISTS,
N. E. Cor. Central Avenue & Eighth St.,
Laboratory, Miami Canal, bet. Third & Fifth Sts.,
CINCINNATI, O.

The most Useful Invention of the Age!
PATENT
CSOMOPOLITAN FURNITURE PASTE!
FOR POLISHING AND RESTORING
Furniture, Pianos, Marbles, Carriages,
&c., &c.,
SUPERIOR TO VARNISH.

☞ *DRIES INSTANTANEOUSLY.* ☜

It brings out the grain of the wood in all its original beauty, and immediately after being applied, the article polished is perfectly dry, thus possessing a very great advantage over varnish or any kind of liquid polish.

It will keep in any climate, and is always ready for use.

ONE BOX IS SUFFICIENT TO RESTORE AN ENTIRE HOUSE OF FURNITURE.

Price 75 Cents per Box. . Double size $1.25.
Each package bears our trade mark.
A LIBERAL DISCOUNT TO DEALERS.
For sale Wholesale by
H. B. HERTS BROS.,
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BY ROYAL LETTERS PATENT.

HERT'S & CO'S
AMALGAMATED
ALUMINUM, ZINC AND PLATINA
PENS.
WARRANTED ANTI-CORROSIVE.

In introducing this invention, Messrs. HERTS & Co. beg to call attention to the following advantages combined in these Pens:

They possess the Anti-corrosive properties of the Gold Pen.

The Freedom of the Quill, and

The Flexibility of the Steel Pen.

Thus *combining* in *themselves* every advantage found in other pens; and by their anti-corrosive properties entirely obviating all the objections hitherto existing against the use of Metallic Pens.

Another advantage peculiar to these Pens, is that they *improve* after being a *short time in use*, and may be left in the ink without fear of injury, as they *never need wiping.*

THE No. 808 "medium points," are adapted for *office use* and *general business purposes.*

THE No. 909 "extra fine points," are adapted for *Ledger, Heading, Posting, Engrossing, Ladies and School use.*

The undersigned have given HERTS & Co's Pens a trial, and are satisfied to recommend them to the general public.
FOWLER & WELLS.

Manufactory, Bradford Works, Birmingham,
ENGLAND.

Orders for the United States, Canada, South America, and the West Indies, must be addressed to

H. B. HERTS, 52 John St, New York,
SOLE CONSIGNEE.

from whom samples may be obtained *gratis*, on application by mail or personally.

The Am. Advg. Agency, 389 Broadway, N. Y., will receive orders for the above-named Pens.

New York, April 18th, 1864.

* * * * * *

We respectfully invite your attention to and consideration of the justly celebrated and reliable remedy for DYSPEPSIA, HEARTBURN, DEBILITY and PROSTRATION. The Proprietors are proud to acknowledge the unparalleled success which has attended the sale of their valuable preparation, known in nearly every portion of the civilized world as the

"GOLDEN BITTERS."

We risk nothing when we term them a *valuable preparation*, for they are one of the few articles of the present day which are not a humbug; and we are willing and able to satisfy any person or persons who will call upon us, that the celebrated "GOLDEN BITTERS" are a genuine *bona-fide hygienic* article. It is the wish of the proprietors that the virtue of the article be tested before condemning. A decision of their merits by any one who has tried them, is worth a million of purchased bogus testimonials.

For Creating a Healthy Appetite

they are invaluable, and are unequalled as a TONIC. They are mild in their action, and operate by giving *vigor* and *strength* to the system,—not by any change they produce in the solids, but through the medium of the living principle.

They are Purely Vegetable,

being composed of Gentian Root, Calamus, Sassafras, and many other remedial agents of the Vegetable world, all preserved in Jamaica Rum and Sherry Wine.

As a Beverage

They are the most *wholesome, invigorating* and *palatable* stimulant ever offered to the public. And the fact of their being prepared chemically and scientifically, precludes the possibility of a bitter, unpleasant taste, common to Bitters generally offered for sale. We especially recommend them to LADIES, and particularly to those suffering from

DEBILITY, WEAKNESS, AND PROSTRATION.

Half a wine glass of these "Bitters" three or four times a day, will produce a remarkable healthy change in persons greatly debilitated.

The "Golden Bitters" have been tried and not found wanting. They are put up in our own *Patent* quart bottles, and for sale by Druggists, Grocers, &c., throughout the world. Each bottle bears a fac-simile of the signature of Hubbel & Co.

GEO. C. HUBBEL & Co, Sole Proprietors.
CENTRAL DEPOT, American Exp. Building, New York.

THE GOLDEN BITTERS.—We are not an advocate of stimulants of an alcoholic character; indeed we deprecate this "daily tonic" idea—this "morning toddy" which we see offered in all sorts of shapes as a recuperator, invigorator, revitalizer, &c. As a rule all artificial stimulants are dangerous remedies, and must be taken into the system as you would mercury or arsenic, in very small doses. But we have had an opportunity to try the now well-advertised article known as Hubbel's Golden Bitters, and are frank to say that where the system needs building up, where a stimulant is required to aid nature in restoring a lost appetite and infusing a vigorous action to the debilitated functions, we can recommend these Bitters. Hubbel's Golden Bitters are evidently intended to improve the debilitated human system, rather than to tickle the palate, and are, therefore a harmless and safe remedy to keep in the house.—*New York Weekly Day Book.*

YONKERS, May 9th, 1864.

MESSRS. GEO. C. HUBBEL & CO.:

GENTS,—Having used only two bottles of your "Golden Bitters," I can recommend them with the utmost confidence as a Tonic, and particularly for a change of diet and water. It is as well for ladies and children, giving them part of a wine glass two or three times a day. Yours respectfully,
GEORGE C. BARKER.

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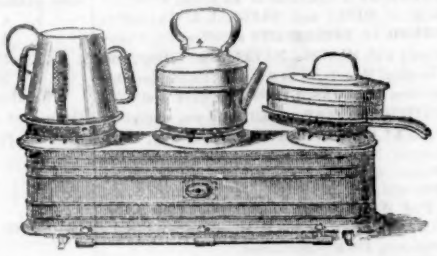

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Will BOIL, BROIL, ROAST, BAKE, TOAST,

STEW, and HEAT IRONS

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THAN COAL OR WOOD.

I have on hand and make to order STOVES and FURNACES for CHEMISTS, TINNERS, BOOK-BINDERS, DENTISTS, TEA STORES, VULCANIZING STOVES, PHOTOGRAPHERS' OVENS, &c., and for TAILORS' and LAUNDRY IRONS.

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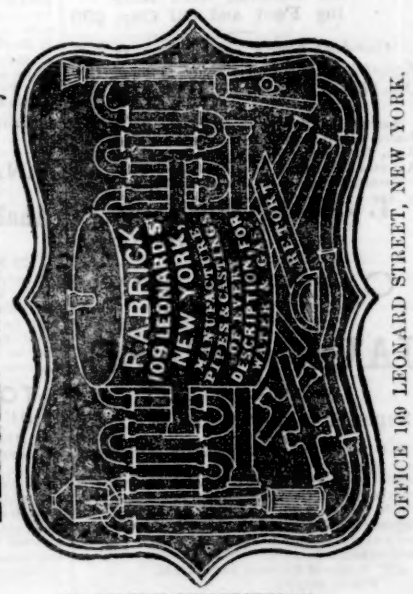

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